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ABSTRACT

ARCHITECTURAL DETAILS, PLANNING, AND FACILITY GUIDELINES FOR INDUSTRIAL ARTS FACILITIES ARE GIVEN, WITH DATA ON PLANNING THE NUMBER, SHAPE, SIZE, AND LOCATION OF SCHOOL SHOPS. INDUSTRIAL ART PROGRAMING AND PERFORMANCE CRITERIA FOR VARYING LEVELS OF EDUCATION ARE DISCUSSED WITH REGARD FOR THE DIFFERENT SHOP CURRICULUMS. THE FACILITY PLANNING IS CONCERNED WITH FLOORING, CEILINGS, PARTITIONS, WALLS, POWER, STORAGE, PLUMBING, AND ENVIRONMENTAL CONTROLS. SPACE REQUIREMENTS FOR VARYING GLASS SIZES ARE GIVEN ALONG WITH AN EQUIPMENT CHECK LIST. DRAWINGS AND AN APPENDIX ARE INCLUDED. (TG)

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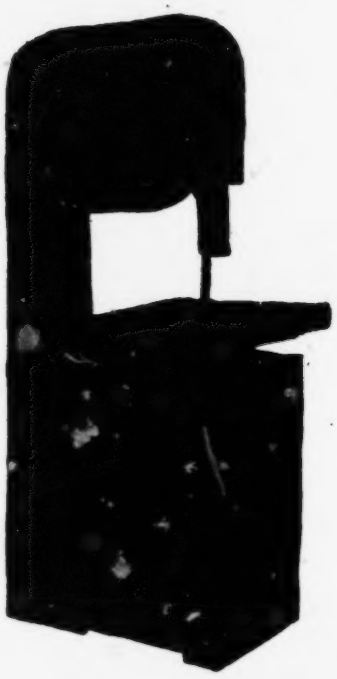

# Planning and Equipping Industrial Arts Facilities

EF 004 095

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*State Department of Education*
*Division of Vocational Education*
*Augusta, Maine*

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## Forward

Planning and Equipping Industrial Arts Facilities, is prepared as a guide to be used by educational teams and architects engaged in planning and designing secondary school facilities.

The recommendations contained in this guide are intended to be used as references in the study of problems arising when formulating specifications for any given facility.

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"Planning and Equipping Industrial Arts Facilities"


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# INDUSTRIAL ARTS

Industrial arts is that phase of general education which offers individuals an insight into our industrial society through laboratory-classroom experiences. Through the study of industrial arts the role of industry and technology is unfolded. Students study the history, growth, and development of industrial organizations, materials, products, processes, and related problems. The complexity of the age in which we live is the result of industrial-scientific inventions and innovations. Industrial arts emphasizes problem-solving experiences which assist students in becoming alert contributors and consumers.

Technology and industry continuously influence our way of life. Through industrial arts a learner develops an awareness and appreciation of the tools, materials, and processes involved in the past and present methods of production. It provides experiences in developing basic skills and knowledge common to many occupations and professions. Industrial arts provides a means by which students can apply in practical and meaningful situations the theoretical principles of science, mathematics, and other related subjects.

## OBJECTIVES OF INDUSTRIAL ARTS

Industrial arts education is designed specifically to help prepare individuals to meet the requirements of an industrial-technological culture. The following four statements of purpose are unique to industrial arts education.

1. TO DEVELOP IN EACH STUDENT AN INSIGHT AND UNDERSTANDING OF INDUSTRY AND ITS PLACE IN OUR SOCIETY. Since industry is a constructive, dynamic force in the world today, it is the responsibility of the school to provide opportunities for each student to understand this force better. Industrial arts provides significant learning experiences relating to industry in which students acquire skill in performance and knowledge of principles and theory through study and application.

2. TO DISCOVER AND DEVELOP STUDENT TALENTS IN INDUSTRIAL-TECHNICAL FIELDS. Students have a diversity of talents. The school's responsibility is to assist students in discovering and developing these talents. It is the responsibility of industrial arts education to identify special talents in industrial-technical fields.

3. TO DEVELOP PROBLEM-SOLVING ABILITIES RELATED TO THE MATERIALS, PROCESSES, AND PRODUCTS OF INDUSTRY. The problem-solving approach in industrial arts involves creative thinking, and gives the student opportunity to apply principles of planning and design, construction techniques, industrial processes, scientific principles, and mathematical computations to the solution of the problems.

4. TO DEVELOP IN EACH STUDENT SKILL IN THE SAFE USE OF TOOLS AND MACHINES. Industrial arts provides planning, construction, and production activities which enable students to acquire industrial-technical skills. These activities offer opportunities to develop tool and machine skills commensurate with the mental and physical maturity of the student.

While these four objectives are considered basic for industrial arts, supplementary objectives may be developed for elementary school, junior high school, high school, and adult programs, as well as special programs for the gifted, the slow learner, and the physically handicapped.

## The Place of Industrial Arts in the School Program

### Elementary Level, K-6

Industrial arts at this level enriches the general program of the classroom. It contributes to the personal development of the child and aids in acquainting him with his environment. Many of the experiences with tools and materials provide exciting worthwhile activities for typical elementary school projects and units. It has no standard content as such, but it helps the classroom teacher and the school to do better the things which they are already trying to do. The industrial arts teacher may serve as consultant to the elementary teachers in a community. As a distinct subject, however, industrial arts may begin in grade six.

### Junior High School Level, Grades 7-9

Industrial arts at the junior high school level is an essential part of the basic education program for both boys and girls. The need of these youth to discover their interests, abilities, limitations and opportunities as producers and consumers of industrial products and services is fundamental to their development and growth. In this program, students have an opportunity to sample or try out various occupations in the manufacturing (wood, metals, plastics, graphic arts, etc.) electrical and power industries. The shop and the program should be well organized and offer as wide a variety of experiences as is feasible. Through such a program avocational and vocational interests and abilities should be revealed or will become more discernible as the youth develop.

Senior High School Level, Grades 9-12

Industrial arts at the senior high school level in Maine should be required for every boy during his freshman year unless he has taken such a course at the junior high school level. Any youth who wishes may elect industrial arts thereafter, but it is offered particularly for those who show special interests and abilities in industrial technical fields. In the early years of this program the pupils should receive experiences in the manufacturing, construction, power and transportation, electrical-electronics and service industries. In the final year of the program pupils will have the opportunity to specialize in one of these industries, providing them with opportunities for advancement toward a chosen goal and occupation.

It should be understood that the industrial arts program at this level should not attempt to provide any more than a sound basis for occupational choice with some competence and skill for initial employment or specialized training. Preparation for the skilled trades and technical employment can best be provided in vocational-technical programs equipped and designed to meet such needs.

Industrial Arts Shops

There are three distinct kinds of industrial arts shops in common use in Maine today. These are the comprehensive general shop, the general shop and the general unit shop. Each has its place in the framework of industrial arts education.

The Comprehensive General Shop

The comprehensive general shop contains equipment for instruction in four or more industries or sections of work in one room, usually under the direction of a single teacher. It is the basic type of industrial arts shop and is recommended for all small schools having only one shop. The four major industries or sections of work recommended for comprehensive general shops are: manufacturing (wood, metal, plastics, etc.), construction, electrical-electronics, power and transportation and service industries. Each of these industries or sections of work can be sub-divided into several different kinds of activities representative of several types of occupations found in the industry. For example, the construction industry or sections of work may include facilities for instruction in architectural drafting, carpentry and millwork, masonry, concrete work, plumbing and heating, plastering and painting. Similar sub-divisions may be found in the other three industries.

The General Shop

The general shop contains equipment for instruction in two or more industries or sections of work. General shops are usually found in a two or three-shop industrial arts department. In a department with two general shops each should contain equipment for instruction in two industries or sections of work. For example, in one shop manufacturing and construction industries would be studied, while in the other shop electrical-electronics and power and transportation industries would be taught.

When decisions are to be made regarding the distribution of industries

or sections of work among the general shops in a multishop department, due consideration should be given to the many factors involved. These include equipment needs, selection of suitable and compatible industries or sections of work, scheduling considerations and teacher abilities.

The General Unit Shop

The general unit shop contains equipment for instruction in several phases of one industry or section of work. Examples of this type of shop would be a general metal manufacturing and fabricating shop with work centers for foundry, machine shop, welding, forging and heat treating and sheet metal fabrication.

General unit shops are usually found in large senior high schools where the enrollment justifies four or more shops.

## Occupational Course in Industrial Arts

### Sequence:

An occupational course in industrial arts shall not be less than three years in length and shall have teachable content, including basic and related subjects, possessing continuity and providing pupils industrial experience of a progressive nature. Regardless of the grade in which he is enrolled, pupil placement in industrial arts classes shall be at that level which is commensurate with his previous experience. Once well placed, his interest in and ability to perform the work required in the course shall determine his advancement. Therefore, an approved occupational course must provide a sequence of at least three years in grade 9 through 12 unless combined with a full-time vocational trade course. Classes of one year or one semester may be offered for special groups.

### Scope:

The program shall be comprehensive and shall include the four prescribed areas of major industrial activity which are: Wood and Metal Manufacturing and Fabrication, Construction, Electrical-Electronics and Power-Transportation.

In order to achieve progression of learning experiences and to encompass the subject matter which this curriculum implies, it is recommended that the program be extended over a six-year period as follows:

| | |
|---|---|
| Grade 7 | Manufacturing Industries |
| Grade 8 | Manufacturing Industries |
| Grade 9 | Manufacturing Industries |

| | |
|---|---|
| Grade 10 | Manufacturing Industries<br>Construction Industries |
| Grade 11 | Power and Transportation Industries<br>Electrical-Electronics Industries |
| Grade 12 | Service Industries<br>Area of Specialization (vocational orientation)<br>or |
| Grade 12 | Areas of Specialization (vocational orientation) |

Time Requirements:

To fulfill the purposes of the program at each level, sufficient time should be allocated not only for the instructional activities but also for getting out materials, tools, and products at the beginning of the period, and for putting these away, washing up, and restoring the shop to order at the close of the period. Double periods, for this reason, are more ideally suited and should be provided whenever possible. Single periods, either separately or as part of a double period, may be devoted to research, planning, designing, reading, discussion, writing, reporting, or the like, which are a necessary part of the program.

The minimum weekly time allotments for each grade level, based on one semester of work for grades 7 and 8 and two semesters of work for grades 9 through 12 should be:

| | | | |
|---|---|---|---|
| Grade 7 | 4 periods | 18 weeks | 160-220 minutes |
| | or<br>2 periods | 36 weeks | 80-110 minutes |
| Grade 8 | 4 periods | 18 weeks | 160-220 minutes |
| | or<br>2 periods | 36 weeks | 80-110 minutes |
| Grade 9 | 5 periods (2 double and 1 single) | | 200-275 minutes |

| | | | |
|---|---|---|---|
| Grade 10 | 5 periods | (2 double and 1 single) | 200-275 minutes |
| Grade 11 | 7 periods | (2 double and three single) or (3 double and one single) | 280-up |
| Grade 12 | 7 periods | (2 double and three single) or (3 double and one single) | 280-up |

In no case should the laboratory time be less than 200 minutes per week in grades 9 and 10, or less than 280 minutes in grades 11 and 12. If a full Carnegie unit of credit is to be allowed, the laboratory time should be supplemented by outside assignments to make up a total of 400 minutes per week.

## Description of what is Included in the Industrial Arts Program

Industrial arts is organized on a basis as representative of modern industry as is possible within practical limits. In Maine, the program embraces the broad areas of wood and metal manufacturing and fabrication, construction, electrical-electronics, power-transportation and service. Graphic arts is also considered. Drawing, sketching and planning are basic to all. These areas are not regarded as subjects but as areas of experience and part of the total program.

To provide a true picture and sampling of industrial tools, materials, processes, products and occupations, each area should be presented on as broad a basis as is practical and feasible.

### Wood Manufacturing and Fabrication Industries

Wood is one of the most common construction materials known to man. Its usefulness both as a raw material and a finished product constitutes a major factor of our culture. The occupations which can be represented in the industrial arts shop are: various line and staff positions of the industry, milling, production, cabinetmaking, patternmaking, carpentry and materials testing.

### Metal Manufacturing and Fabrication Industries

Metal is another important material upon which our industrial and scientific technology depends. The sections of metal manufacturing and fabrication which can be taught are: various line and staff positions of the industry, machine work, production, foundry work, welding, forging and heat treating, sheet metal work, bench work and materials testing.

Residential Construction Industries

The residential construction industry occupies a major part of the construction industries in America. This phase of the construction industry utilizes a wide variety of materials and requires workers with a knowledge of assembly and construction operations, and varying levels of abilities and skills. The occupations which can be experienced in the industrial arts shop are: architectural drafting, carpentry and millwork, masonry, concrete work, plumbing, heating, plastering and painting.

Electrical-Electronics Industries

Electricity and its more highly technical counterpart, electronics, have been the prime movers in the development and growth of our present industrial, social and democratic culture. The industrial arts shop provides not only theoretical but also practical applications which are essential for their understanding. Low voltage wiring and circuitry, house wiring, power generation and distribution, motors, appliance repairs, radio transmission and reception are taught.

Power-Transportation Industries

The development of the combustion engine and similar sources of power for land, sea and air vehicles has been a major force in shrinking our world. Likewise, our increasing reliance upon power generated by gasoline and oil in our daily living makes it almost imperative that we understand not only the principles upon which such power is developed and used, but also how to maintain those vehicles and devices which utilize such power. The industrial arts shop can include in this area small gasoline engines (land and water), automotives,

rocket power and diesel engines.

Services Industries

The services industries have been established in response to the need for skilled technical servicing to keep the many and diverse products of industry in operation, and in service to the consumer whether this be the individual, business or industry itself. The industrial arts shop can include in this area, an understanding of small service business management, appliance servicing, automotive servicing and repair and refinishing industries.

Technical Drawing and Planning

This area provides the foundation for all industrial activities and in the same manner, for all industrial arts areas. Students should learn to read plans, sketch, create simple designs, draw working plans and become familiar with the basic tools and materials of instrumental and general drawing. They should also learn to develop consumer skills and knowledges in the selection of projects, materials, tools and products of industry. They should learn to plan operation procedures, use reference materials, estimate costs of production and prepare stock orders and bills of materials.

Graphic Arts

The printed word is the basis of our moral, spiritual, cultural, political and technical growth. The fields of printing and publishing contain many experiences which can be included in the industrial arts shop. Among these are: letter press and offset printing, stencil printing, binding, rubber stamp making and photography.



## Functional Considerations in Planning Any Shop

I. NUMBER OF INDUSTRIAL ARTS SHOPS

In determining the number of shops for a new or existing building, consideration should be given the number of pupils who will be accommodated in shop classes. Sufficient space should be allotted to provide for estimated future enrollments and provision should be made for flexibility. Recommended departmental organization may be found under facilities.

II. PRINCIPLES RELATING TO SIZE OF ANY SHOP

The size of any shop will be determined in terms of the needs of the proposed program.

A. Following factors need to be carefully considered

1. the amount of equipment required
2. the amount and types of work stations
3. the nature and depth of the learning activities involved
4. the maximum number of students to be accommodated
5. the grade levels to be served

B. A logical method to determine space requirements

1. select the needed equipment in terms of the maximum number of students to be accommodated at one time.
2. make cardboard cutouts to scale of each piece of equipment, including needed working areas and allowing proper aisle space.
3. determine space required for office, instructional (classroom) and planning purposes.
4. determine space required for storage of materials, supplies, projects, finishing, etc.
5. then place the cutouts on a scaled layout to determine overall space needed.



III. PRINCIPLES RELATING TO THE SHAPE OF ANY SHOP

To promote efficiency, the aim should be to utilize a shape which would give the largest amount of area in the most compact shape. However, when this is done, such as in a square shop, valuable wall space is lost. As a compromise, therefore, the rectangular shape is recommended.

A. a ratio of width to length of 1 to 1½ as a minimum (most desirable) and 1 to 2 as a maximum is recommended. This pertains to the work area and does not include auxiliary rooms.

B. It is recommended that the width of a shop should never be less than 30 feet.

C. All irregular shapes of shops should be avoided.

IV. LOCATION OF SHOPS

It is recommended that the shops should be located in a special wing in a new building and an attached wing in an existing building.

V. ARCHITECTURAL DETAILS

A. Floors

Hardwood flooring, treated with a nonslip finish, is suggested for wood areas. In the areas of metals and transportation where the floors are subjected to considerable oil, grease, dirt and water, concrete floors are recommended. All other areas of work, wood or tile may be used.

B. Ceiling

The materials used for the ceiling should be of the accoustical type and light in color. The ceiling height of shops should not be less than ten feet. Twelve-foot ceilings should be provided whenever possible, especially where long materials will be handled. If an automobile lift is to be installed, ceiling clearance should be checked with the manufacturer.

C. Partitions

Partitions between shops should be soundproof and non-bearing so they may be easily moved to provide for expansion or changing conditions.

Partitions that form auxiliary rooms in which pupils will be working should have glass areas large enough to permit the instructor to supervise all activities. The entire shop area should be visible from any point.

D. Walls

The lower part of shop walls, up to a height of five or six feet, should be made of impervious materials which can be easily cleaned.

The lower portion of walls should be free from projecting beams or ducts to allow efficient placement of tool panels, cabinets, machines, chalkboards, bulletin boards and display shelves.

The window area in the shop should equal 15% of the floor area.

E. Windows

Full advantage should be taken of all possibilities for natural lighting. North light should be provided whenever possible.

F. Lighting

The shop must be well lighted. The light should be well diffused, eliminate glare at the line of vision and cast no shadows around the work. Sufficient artificial illumination is necessary so at least 50 foot candles of light is available for general room lighting and up to 100 foot candles for auxiliary lighting in special areas or for fine work.

G. Heat

A heating system, thermostatically controlled, sufficient to maintain a temperature of 68 degrees should be provided.

H. Ventilation

The ventilation system should provide a constant gentle flow of clean air at all times while the shop is in use.

I. Exhaust system

Special facilities should be provided to remove fumes, odors, vapors and dust in areas of the shop where they are likely to be present.

J. Power

Power controls should be centralized on a master control panel that can be locked. This panel should have a pilot light and

should be located near the instructor's desk or office. Provision should be made for one double electric outlet (110 volts) for every eight feet of wall length, with provision for ground cord. These outlets should be located approximately 42 inches above the floor.

Most shops can operate on 119-220 volts three phase electrical circuits. A bus system can be installed to take care of all machines not located near a wall.

Control buttons should be located at strategic parts of the shop so that the master control panel may be shut off immediately if the instructor sees a student in a hazardous position while working at a machine.

K. Color Scheme

A well-decorated shop promotes safety, improves students interest in classwork, encourages pride in the shop, aids in cleanup and makes the shop a more attractive place in which to work.

L. Auxiliary areas or rooms

The following auxiliary areas should be considered when planning a shop: drawing and planning area, finishing area, storage area, instructor's office and toilet facilities.

M. Entrances and exits

It is highly desirable to have at least two entrance-exits in every school shop. The doors should swing outward. An overhead door is needed for power mechanics or similar activities that are taught in the shop program.

N. Plumbing

A toilet facility should be located in the shop or in close proximity and should include one urinal, one flush and one electric hand dryer.

There should be a wash-up facility located near an entrance-exit. A Bradley semi-circular type washing sink is very satisfactory. A paper towel dispenser should be located nearby the wash-up facility.

A sink with an acid resistant trap should be installed in the metals area. A drinking fountain should be installed as a separate installation and properly located in the shop. A floor drain and an auxiliary water outlet should be located in the power mechanics area. An ample supply of hot and cold water should be supplied where needed in any facility.

Artificial gas should be available in the soldering, forging, heat treating and art metals areas of the shop.

An air compressor should be installed in all shops with outlets at needed points for spraying, etc. The compressor unit can be placed in an auxiliary room or outside the shop proper to eliminate the undesirable noise.

## Facilities

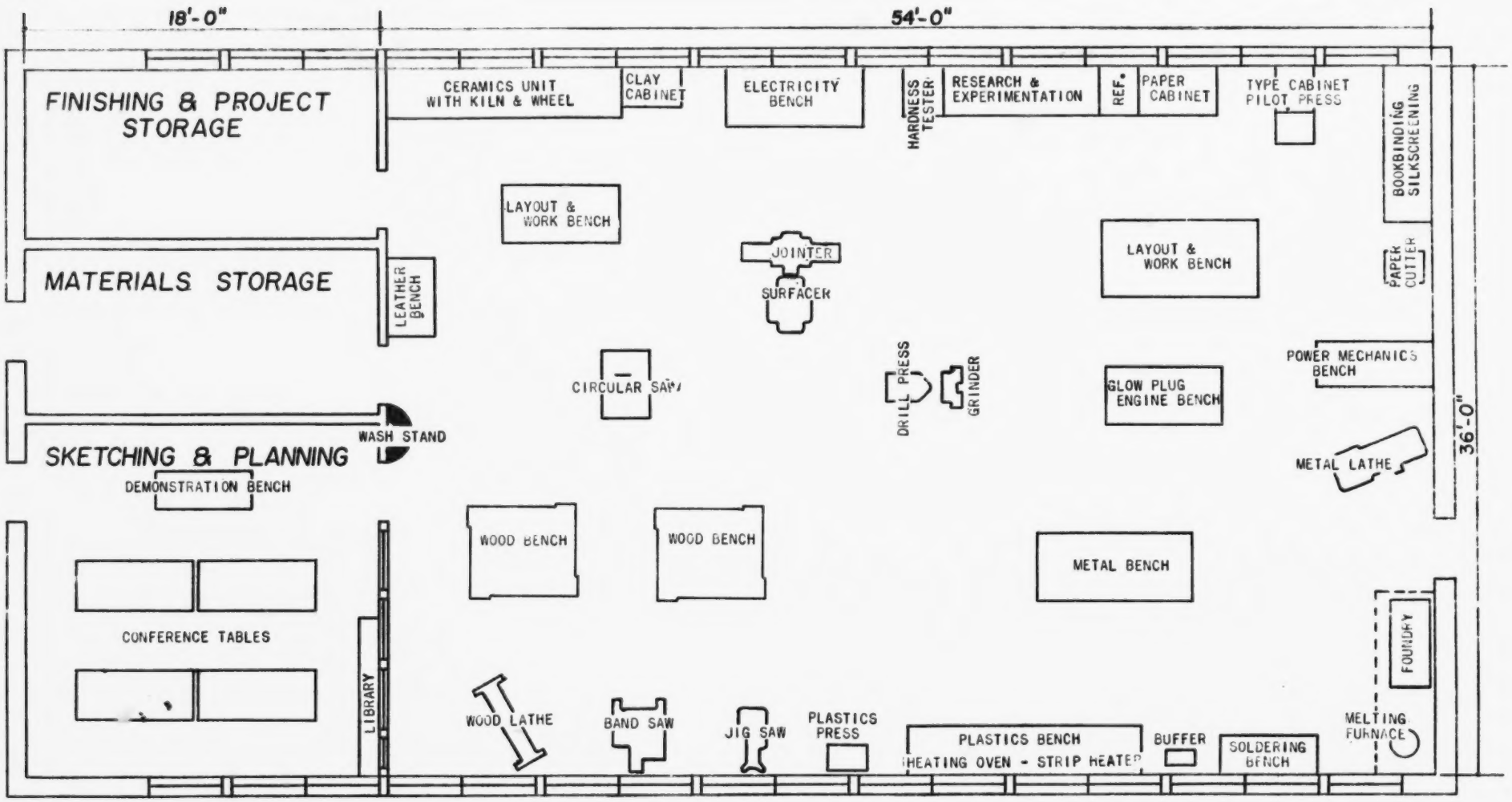
### 1. Space

In order that there is sufficient space in which to organize an approved industrial arts program, the following table may be used as a guide in planning industrial arts laboratories.

a. Recommended Number and Types of Industrial Arts Laboratories and Instruction That May be Provided for Junior High Schools and Grades Seven and Eight of the Elementary School According to School Enrollment.

| Total School Enrollment | Number & Types of Laboratories | Space Requirement | Instructional Unit |
|---|---|---|---|
| To 250 | One Unit | | |
| | 1. General Shop | Lab. area 2000 sq. ft.<br>Aux. space 650 sq. ft.<br>Total size 2650 sq. ft. | Manufacturing Industries (Woods, Metals, Plastics, Leather, Ceramics, Graphic Arts)<br>Construction Industries<br>Power & Transportation Ind.<br>Electricity<br>Research & Experimentation |
| 250 to 500 | Two Units | | |
| | 1. General Shop | Lab. area 2000 sq. ft.<br>Aux. space 650 sq. ft.<br>Total size 2650 sq. ft. | Manufacturing Industries (Woods, Metals, Plastics, Leather, Ceramics, Graphic Arts)<br>Construction Industries<br>Power & Transportation Ind.<br>Electricity<br>Research & Experimentation |
| | 2. General Shop | Lab. area 2000 sq. ft.<br>Aux. space 650 sq. ft.<br>Total size 2650 sq. ft. | Manufacturing Industries (Woods, Metals, Plastics, Leather, Ceramics, Graphic Arts)<br>Construction Industries<br>Power & Transportation Ind.<br>Electricity<br>Research & Experimentation |

| Total School Enrollment | Number & Types of Laboratories | Space Requirement | Instruction Unit |
|---|---|---|---|
| 500 to 750 | **Three Units** | | |
| | 1. General Shop | Lab. area 2000 sq. ft.<br>Aux. space 650 sq. ft.<br>Total size 2650 sq. ft. | Manufacturing Industries (Woods, Metals, Plastics, Leather, Ceramics, Graphic Arts)<br>Construction Industries<br>Power & Transportation Ind.<br>Electricity<br>Research & Experimentation |
| | 2. General Shop | Lab. area 2000 sq. ft.<br>Aux. space 650 sq. ft.<br>Total size 2650 sq. ft. | Manufacturing Industries (Woods, Metals, Plastics, Leather, Ceramics, Graphic Arts)<br>Construction Industries<br>Power & Transportation Ind.<br>Electricity<br>Research & Experimentation |
| | 3. General Shop | Lab. area 2000 sq. ft.<br>Aux. space 650 sq. ft.<br>Total size 2650 sq. ft. | Manufacturing Industries (Woods, Metals, Plastics, Leather, Ceramics, Graphic Arts)<br>Construction Industries<br>Power & Transportation Ind.<br>Electricity<br>Research & Experimentation |




*INSTRUCTIONAL UNITS:*

- *SKETCHING & PLANNING*
- *WOODS*
- *METALS*
- *PLASTICS*
- *CERAMICS*
- *GRAPHIC ARTS*
- *ELECTRICITY*
- *POWER & TRANSPORTATION*
- *RESEARCH & EXPERIMENTATION*

*SPACE REQUIREMENTS:*

*LABORATORY AREA — 1944 SQ. FT.*
*AUXILIARY SPACE — 648 SQ. FT.*
*TOTAL AREA — 2592 SQ. FT.*

STATE OF MAINE
DEPARTMENT OF EDUCATION
BUREAU OF VOCATIONAL EDUC.

TYPICAL JUNIOR HIGH SCHOOL
INDUSTRIAL ARTS LAYOUT-ONE TEACHER

SCALE 0 FT. 9

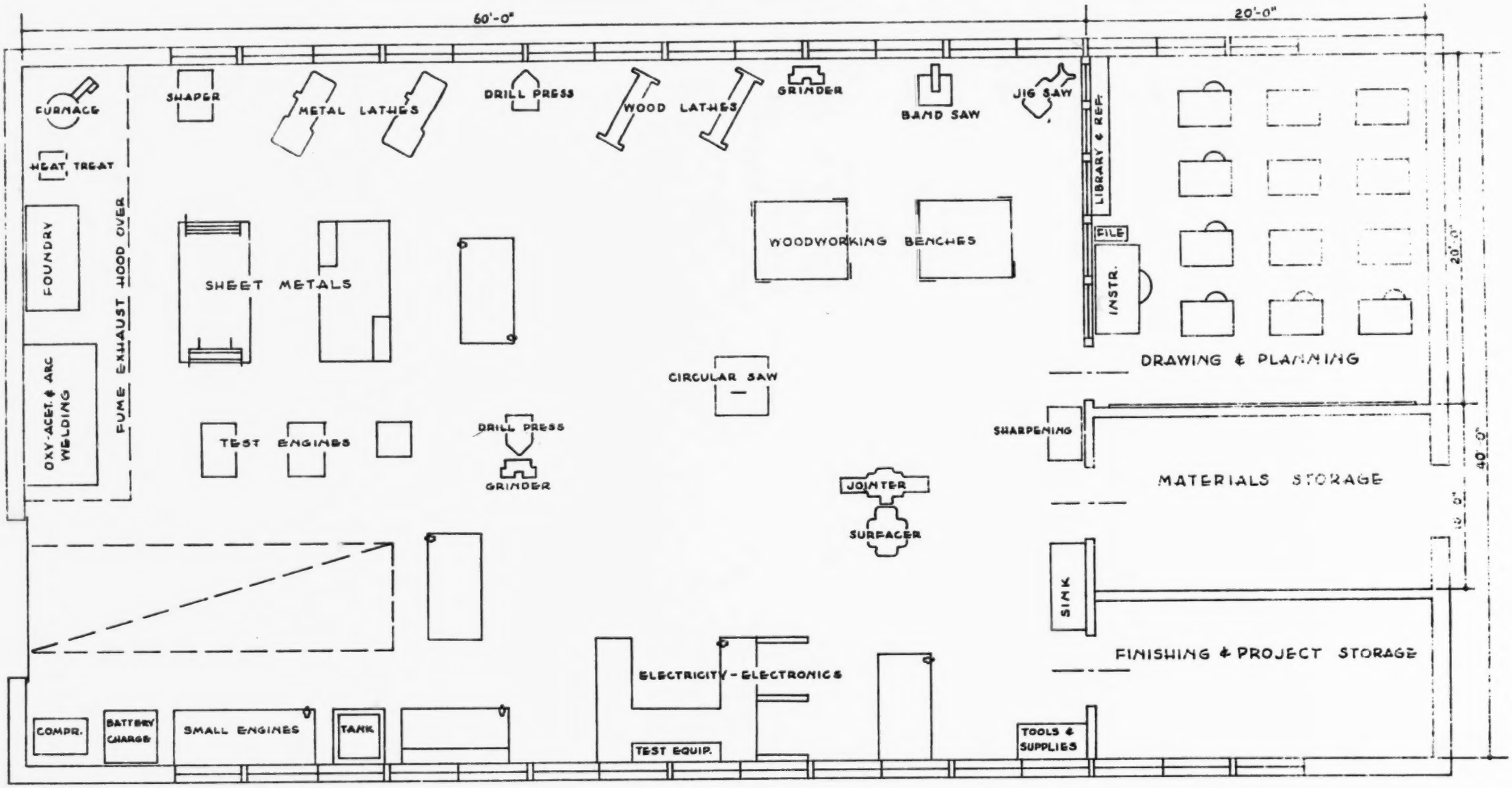
JULY 1963
DR. BY EAP

b. Recommended Number and Types of Industrial Arts Laboratories and Instruction That May be Provided for Four-Year and Senior High Schools According to School Enrollment

| Total School Enrollment | Number & Types of Laboratories | Space Requirements | Instructional Units |
|---|---|---|---|
| To 250 | ONE UNIT<br>1. Comprehensive General Shop | Lab. area 2400 sq. ft.<br>Aux. area 800 sq. ft.<br>Total size 3200 sq. ft. | Drawing & Planning<br>Electricity-Electronics<br>Metals Industries<br>Power & Transportation<br>Wood & Construction |
| 250 to 500 | TWO UNITS<br>1. General Shop | Lab. area 1800 sq. ft.<br>Aux. area 600 sq. ft.<br>Total size 2400 sq. ft.<br>(Planning room would be common to both labs using Aux. space from each laboratory) | Drawing & Planning<br>Metals Industries<br>Wood & Construction |
| | 2. General Shop | Lab. area 1800 sq. ft.<br>Aux. area 600 sq. ft.<br>Total size 2400 sq. ft. | Drawing & Planning<br>Electricity-Electronics<br>Power & Transportation |
| 500 to 750 | THREE UNITS<br>1. General Shop | Lab. area and aux. area 2800 sq. ft. | Drawing - Graphic Arts<br>Communications<br>Photography |
| | 2. General Shop | Lab. area 1800 sq. ft.<br>Aux. area 600 sq. ft.<br>Total size 2400 sq. ft.<br>(Planning room would be common to both labs using Aux. space from each laboratory) | Drawing & Planning<br>Metal Industries<br>Wood & Construction |
| | 3. General Shop | Lab. area 1800 sq. ft.<br>Aux. area 600 sq. ft.<br>Total size 2400 sq. ft. | Drawing & Planning<br>Electricity-Electronics<br>Power & Transportation |

| Total School Enrollment | Number & Types of Laboratories | Space Requirements | Instructional Units |
|---|---|---|---|
| 750 to 1000 | FOUR UNITS plus Drafting Room | 30 X 50<br>1500 sq. ft. | |
| | 1. Wood Industries | 40 x 60<br>2400 & Aux. room | Cabinet Making<br>Construction (house)<br>Boat Building<br>Laminating<br>Fiberglass<br>Wood Turning |
| | 2. Metal Industries | 40 x 60<br>2400 & Aux. room | Plumbing<br>Sheet Metal<br>Bench Metal<br>Welding<br>Foundry<br>Machining<br>Forging<br>Art Metal |
| | 3. Electricity-Electronics industries | 35 x 50<br>1600 & Aux. room | Fundamentals of electricity<br>Radio<br>Television<br>Electric Motors |
| | 4. Power & Transportation Industries | 40 x 75<br>3000 & Aux. room | Small engines<br>Outboards<br>Auto mechanics<br>Hydraulics<br>Aircraft<br>Diesel<br>Jets |
| 1000 to 1250 | FIVE UNITS plus Drafting Room | 30 x 50<br>1500 sq. ft. | |
| | 1. Wood Industries | 40 x 60<br>2400 & Aux. room | Cabinet Making<br>House Construction<br>Laminating<br>Boat building<br>Fiberglass |

| Total School Enrollment | Number & Types of Laboratories | Space Requirements | Instructional Units |
|---|---|---|---|
| | 2. Metal Industries | 40 x 60<br>2400 & Aux. room | Sheet Metal<br>Bench Metal<br>Art Metal<br>Forging<br>Foundry<br>Welding<br>Machining<br>Plumbing |
| | 3. Electricity-Electronics | 35 x 50<br>1600 & Aux. room | Fundamentals of Elec.<br>Radio<br>Television<br>Electric motors |
| | 4. Power & Transportation | 40 x 75<br>3000 & Aux. room | Small engines<br>Outboards<br>Auto mechanics<br>Hydraulics<br>Aircraft<br>Diesel - jets |
| | 5. Graphic Arts | 36 x 50<br>1800 & Aux. room | Printing<br>Block printing<br>Offset<br>Silkscreening<br>Rubber stamp<br>Book binding<br>Laminating (plastics) |




INSTRUCTIONAL UNITS:

- DRAWING & PLANNING
- ELECTRICITY - ELECTRONICS
- METALS INDUSTRIES
- POWER & TRANSPORTATION
- WOOD & CONSTRUCTION

SPACE REQUIREMENTS

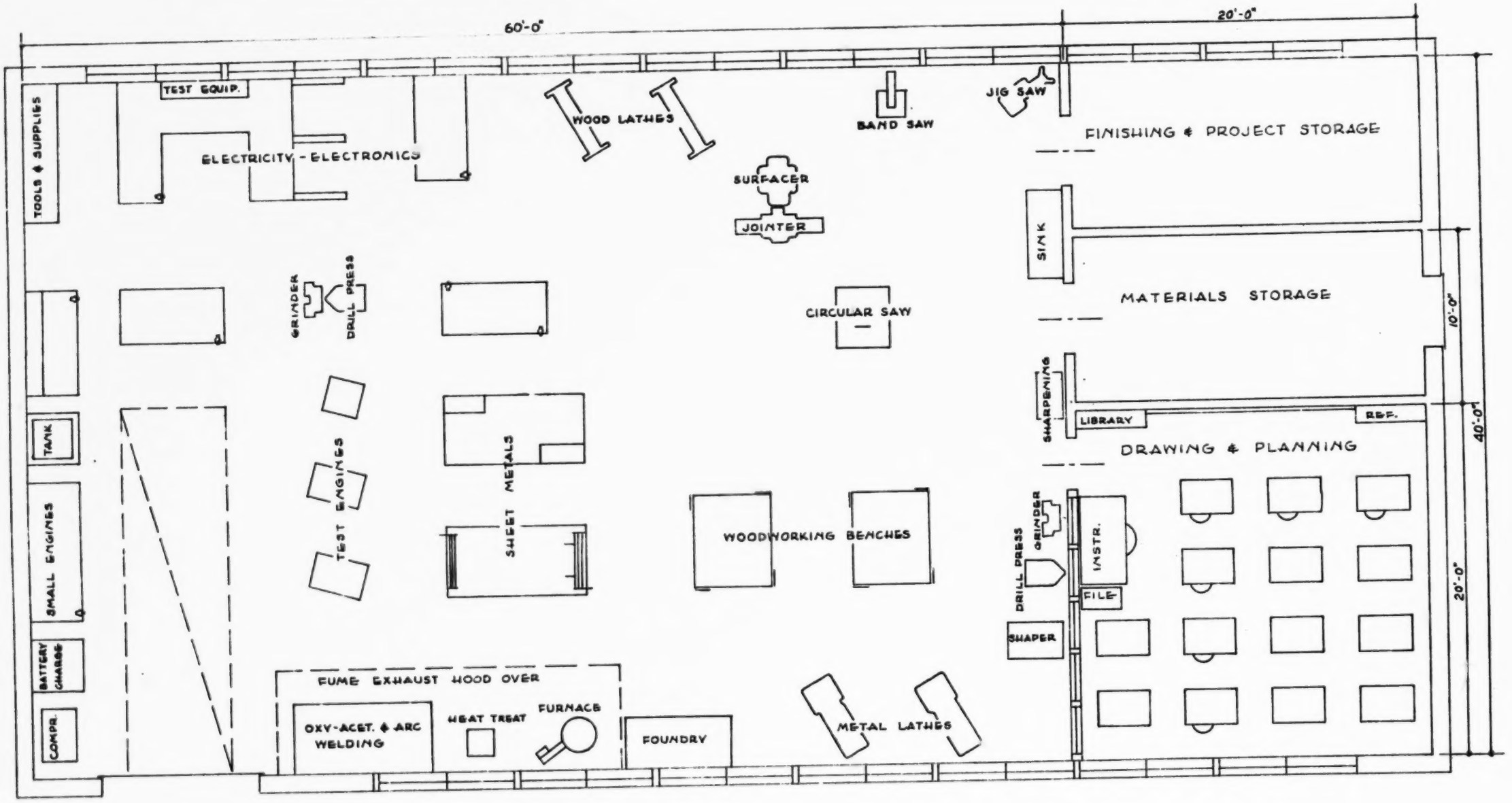
| | |
|---|---|
| SHOP AREA — | 2400 SQ. FT. |
| AUXILIARY SPACE — | 800 SQ. FT. |
| TOTAL AREA — | 3200 SQ. FT. |

STATE OF MAINE
DEPARTMENT OF EDUCATION
BUREAU OF VOCATIONAL EDUC.

# TYPICAL INDUSTRIAL ARTS LAYOUT
FOR SINGLE TEACHER

SCALE 0 1' 3'
PLAN 'A'

JULY 1962
DR. BY JSG




INSTRUCTIONAL UNITS:

- DRAWING & PLANNING
- ELECTRICITY – ELECTRONICS
- METALS INDUSTRIES
- POWER & TRANSPORTATION
- WOOD & CONSTRUCTION

SPACE REQUIREMENTS:

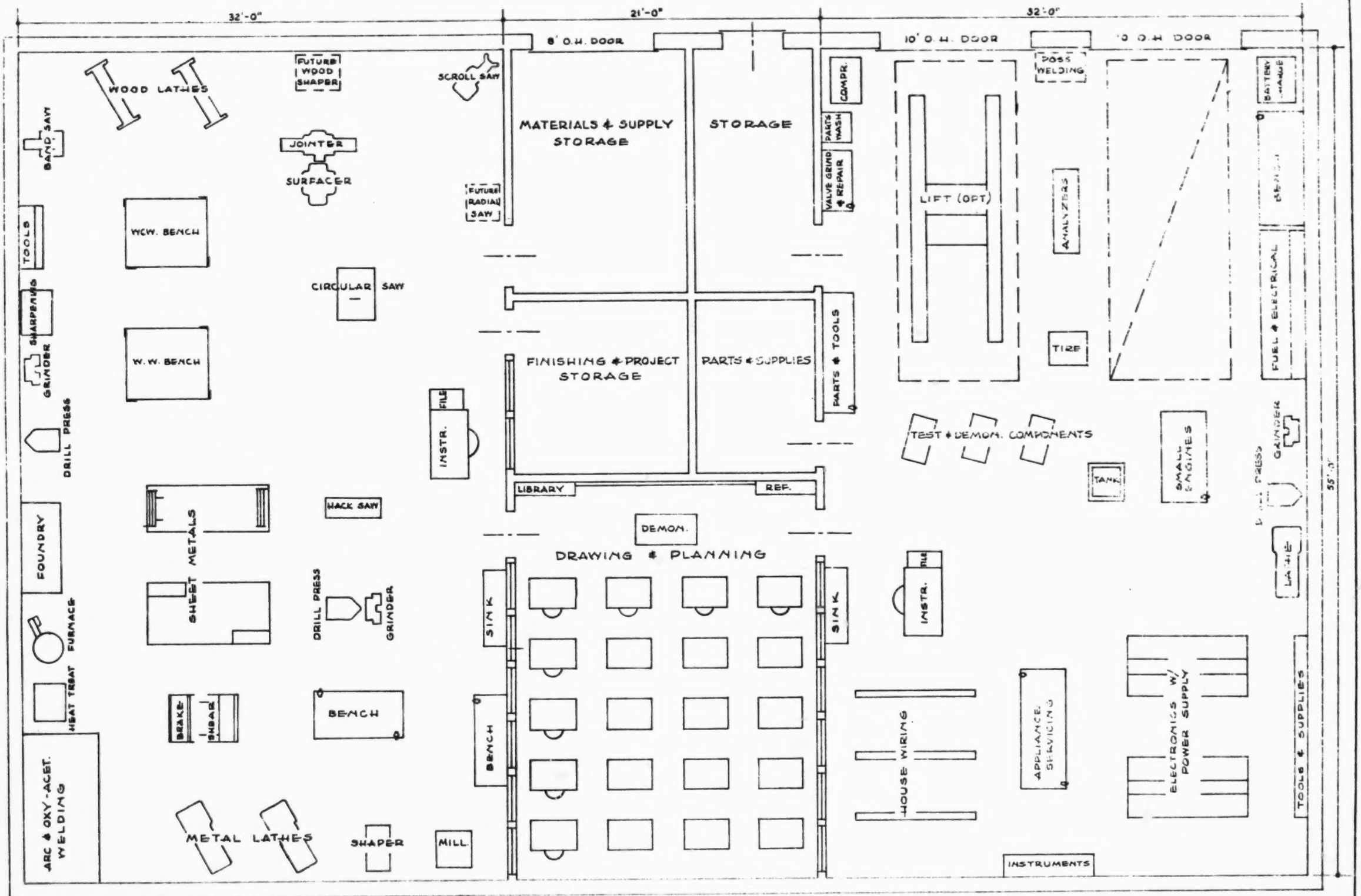
| | |
|---|---|
| SHOP AREA —— | 2400 SQ. FT. |
| AUXILIARY SPACE – | 800 SQ. FT. |
| TOTAL AREA —— | 3200 SQ. FT. |

STATE OF MAINE
DEPARTMENT OF EDUCATION
BUREAU OF VOCATIONAL EDUCATION

# TYPICAL INDUSTRIAL ARTS LAYOUT
FOR ONE TEACHER SHOP

SCALE 0 FEET 5
PLAN 'B'

JULY 1962
DR. BY JSG




INSTRUCTIONAL UNITS — TWO TEACHERS

- DRAWING & PLANNING
- ELECTRICITY - ELECTRONICS
- METALS INDUSTRIES
- POWER & TRANSPORTATION
- WOODS & CONSTRUCTION

SPACE REQUIREMENTS:

| | |
|---|---|
| EACH SHOP AREA | 1760 SQ. FT. |
| AUXILIARY SPACE | 1155 SQ. FT. |
| TOTAL AREA | 4675 SQ FT. |

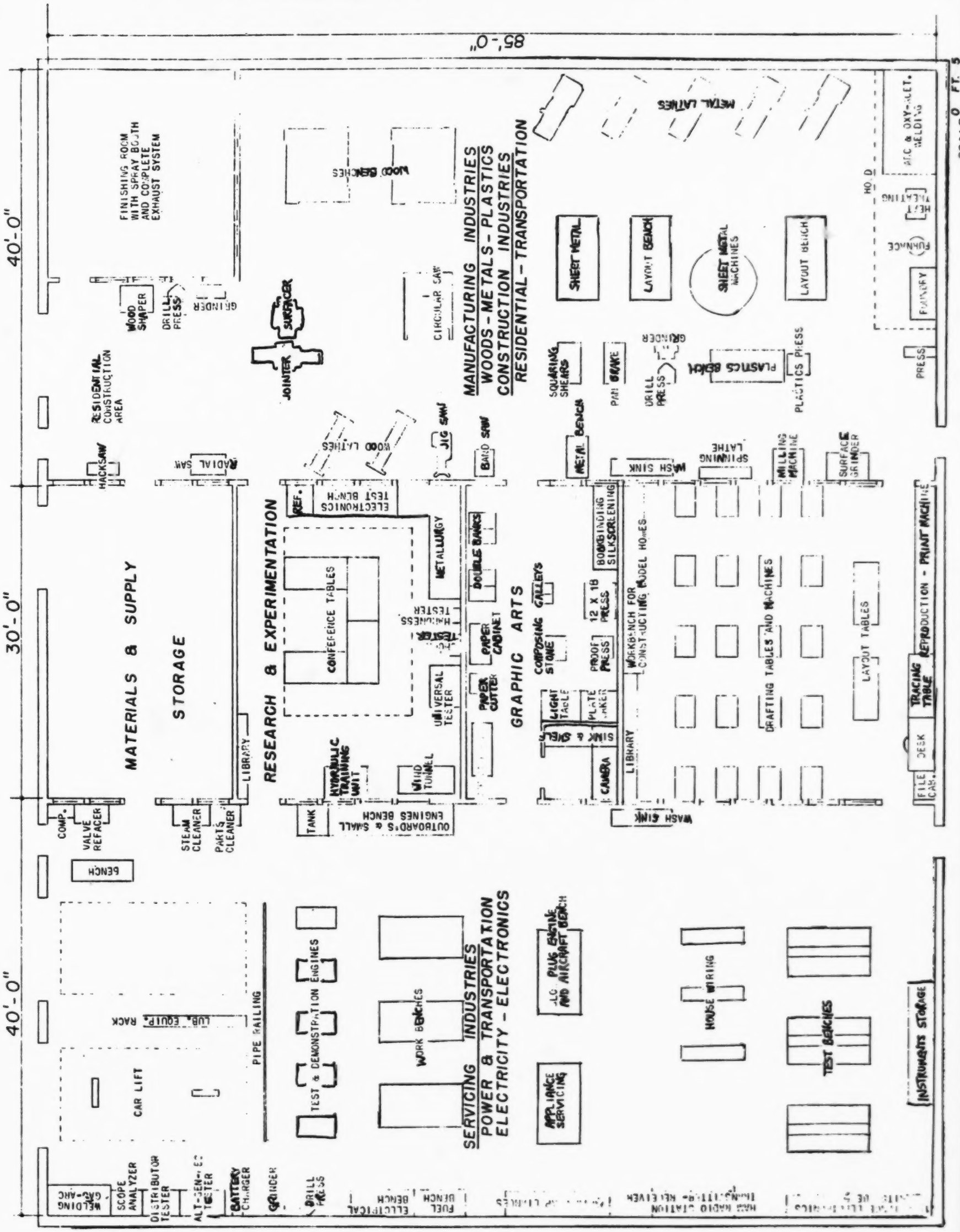
STATE OF MAINE
DEPARTMENT OF EDUCATION
BUREAU OF VOCATIONAL EDUCATION

# TYPICAL INDUSTRIAL ARTS LAYOUT

SCALE 0 FEET 8
PLAN 'C'

JULY 1962
DR BY JSG

Best available copy



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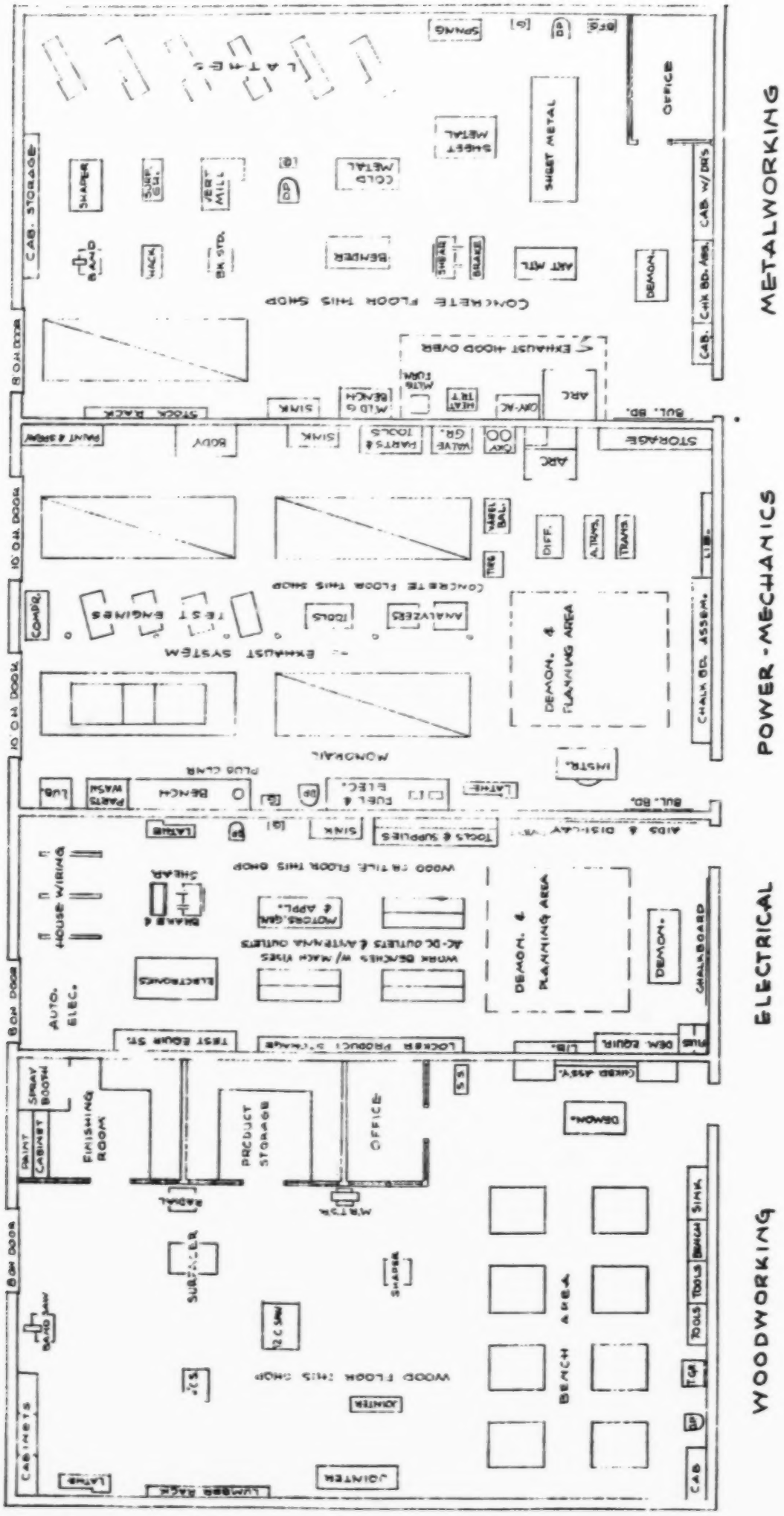

# Industrial Arts Equipment Inventory

The following list of tools, equipment and furniture are considered essential for successfully teaching industrial arts in the comprehensive general shop at the secondary level. This list is a revised copy of the 1956 booklet distributed by the state department of education. All items have been classified in terms of their function and were selected on the basis of their quality and ability to perform these functions well. Acceptable brand names and catalog numbers have been carefully indicated. Substitutions of equal or better quality and description may be made at the descretion of the instructor. Prices almost certainly will vary if the items listed are put out for bid as the prices listed herein are catalog prices and can only serve as an indication of what the current prices of individual items are at this time.

The quantity of each item has been listed for the various areas, with the belief that a class of 16 pupils would be a fair average. The prices indicated are as listed in 1965 catalogs from the leading industrial arts supply companies.

The total cost of the equipment found in this edition represents an investment of 23,000.00, which is an approximate increase of 250% over the 1956 edition.

June, 1965

## LAYOUT TOOLS AND EQUIPMENT

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Awl, Scratch | | Stanley 7A | 3 | 3 | 2 | | | 1.20 |
| Bevel, Sliding T | 8" | Stanley 18TB | 1 | 1 | | | | 3.00 |
| Calipers, Hermaphrodite | 6" | Starrett | | 1 | | | | 4.10 |
| Inside | 6" | Starrett | | 1 | | | | 3.20 |
| Micrometer | 0-1" | Browne & Sharpe 5994 | | 1 | | | | 16.00 |
| Micrometer | 1-2" | Browne & Sharpe 82 | | 1 | | | | 17.25 |
| Outside | 4" | Starrett 79 | | 2 | | | | 3.00 |
| Outside | 6" | Starrett 79 | | 1 | | | | 3.20 |
| Outside | 8" | Starrett 79 | 2 | | | | | 3.85 |
| Pule | | Browne & Sharpe 388 | 1 | | | | | 10.70 |
| Dividers, Spring, Solid nut | 6" | Starrett 83 | | 1 | | | | 3.20 |
| Wing | 8" | Stanley 58 | 1 | 1 | | | | 4.75 |
| Gauge, American Standard Wire | | Starrett 281 | | 1 | | | | 6.90 |
| Bit | | Stanley 47 | 1 | | | | | 1.45 |
| Center | | Starrett 391 | | 3 | | | | 2.45 |
| Protractor and Depth | 6" | Starrett 493 | | 1 | | | | 9.15 |
| Drill Point | | Starrett 22 C | | 1 | | | | 6.65 |
| Fillet and Radius | | Starrett 272A | | 1 | | | | 4.95 |
| Automotive Wire Gap | | Snap-on 309W | | | | 1 | | 1.75 |
| Marking | | Stanley 65G | 2 | | | | | 3.05 |
| Mortising (Butt ) | | Stanley 95 G | 1 | | | | | 4.95 |
| Screw Pitch | | Starrett 40 | | 1 | | | | 3.30 |
| Surface | | Starrett 57B | | 1 | | | | 14.50 |
| Tap & Drill | | Starrett 185 | | 1 | | | | 6.95 |
| Telescoping (Set) | | Starrett 5229F | | 1 | | | | 14.10 |
| Thickness | | Starrett 172A | | | | 2 | | 3.80 |
| United States Standard | | Starrett 283 | | 1 | | | | 6.90 |
| Indicator, Dial Test, Universal | | Starrett 196A | | 1 | | | | 25.25 |
| Level, Aluminum | 24" | Columbian 6524 | 1 | 1 | | | | 4.98 |
| Plumb Bob | | Lufkin ZD 29 | 1 | | | | | .55 |
| Punch, Center | 1/4"x 5" | Starrett2640 | | 2 | 1 | 1 | | .65 |
| Hollow Tinners | 5/8" | Pexto | | 1 | | | | 3.40 |
| Hollow Tinners | 3/4" | Pexto | | 1 | | | | 4.00 |
| Hollow Tinners | 7/8" | Pexto | | 1 | | | | 4.85 |
| Hollow Tinners | 1" | Pexto | | 1 | | | | 5.50 |
| Drive Pin (Set) | | Starrett 565 | | 1 | | | | 4.55 |
| Prick | 3/8" x 5" | Stanley 796 | | 2 | 1 | 1 | | .80 |
| Solid | 1/8" | Stanley 641 | | 1 | | | | .54 |
| Chassis Set) | 1/2, 3/4, 7/8, 1, 1 1/4 | Greenlee #730 | | 1 | | | | 15.65 |
| Revolving | | Osborne 223M | | 1 | | | | 2.15 |
| Rule, Circumference | 36" | Pexto 95 | | 1 | | | | 7.30 |
| Push-Pull | 8' | Stanley W8 | 2 | 1 | | | | 1.30 |
| Shrink-rule | 3/16" Shrink | Lufkin 35P | 1 | | | | | 6.50 |
| Steel Bench | 12" | Lufkin 6[illegible] | | 2 | 2 | | | 2.65 |
| Steel, Flexible | 6" | Starrett 310 | | 3 | | | | 1.85 |
| Wood, Bench | 12" | Stanley 24½V | 6 | | | | | 1.65 |
| Wood, Bench | 24" | Stanley 34V | 2 | | | | | 1.80 |
| Scriber | | Starrett 67 | | 2 | 1 | | | 2.50 |
| Stamp, Steel (Figures Set) | ⅛" | Pexto 90 | 1 | | | | | 3.85 |
| (Letters Set) | ⅛" | Pexto 940 | 1 | | | | | 11.50 |

## LAYOUT TOOLS AND EQUIPMENT

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Square, Combination | | Stanley 1200 | 2 | 2 | | | | 2.35 |
| Combination Set | 18" | Lufkin 525 | | 1 | | | | 27.00 |
| Solid | 3" | Starrett 20 | | 1 | | | | 13.95 |
| Steel | 24" | Stanley 100 | 2 | 1 | | | | 4.75 |
| Steel | 12" | Stanley 12S | 1 | | | | | 2.45 |
| Try | 8" | Stanley 12TS | 4 | | | | | 2.50 |
| Tape, Steel | 50' | Lufkin H433 | 1 | | | | | 6.70 |
| Trammel Points | | Stanley 4TP | 1 | | | | | 2.90 |
| V-Block and Clamp (Set) | | Starrett 271C | | 1 | | | | 9.80 |
| | | | 122.18 | 30.45 | 11.85 | 11.40 | 1 | $249.40 |

## PLANNING EQUIPMENT

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Board, Drawing | 18' x 24" | | | | | | 6 | 3.00 |
| Compasses | 6½" | Vemco C110 | | | | | 6 | 4.45 |
| Curve, Irregular | | K & E #3 | | | | | 3 | .80 |
| Drawing Instruments (Set) | | K & E A-170-V | | | | | 2 | 18.75 |
| Scale, Architect | 12" | K & E #18 | | | | | 6 | .60 |
| Triangle, 30-60 | 10" | K & E 630P | | | | | 6 | 1.60 |
| , 45-45 | 6" | K & E 945P | | | | | 6 | .60 |
| Square, T | 24" | K & E 11-P | | | | | 6 | 3.80 |
| Dividers | 5" | K & E #13 | | | | | 6 | 1.70 |
| Protractor | 6" | K & E #26 | | | | | 2 | .60 |
| Lettering Set | | Wrico Zephyr | | | | | 1 | 8.82 |
| | | | | | | | | $44.42 |

## TESTING AND MEASURING EQUIPMENT

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Alignment Set, Magnetic | | Bender 30 INS, 400 | | | | 1 | | 212.95 |
| Analyzer, Portable Kit | | Allstate 29A2126K | | | | 1 | | 99.95 |
| Charger, Batter[illegible] | 6A-12A | Allstate Sur-charge | | | | 1 | | 24.65 |
| Freq[illegible]meter | | Allstate | | | | 1 | | 2.39 |
| Tal[illegible]meter | | Jenton 775 | | | 1 | | | 16.95 |

## TESTING AND MEASURING EQUIPMENT

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Gauge, Air Hose, Heavy Duty | 10-130 lbs. | Allstate | | | | 1 | | 9.65 |
| Tire Pressure | 20- 12 | Allstate | | | | 2 | | 3.80 |
| Hydrometer, Battery | | Allstate | | | | 1 | | 1.59 |
| Meter, Ammeter, Multiscale, A.C. | | Simpson 370 | | | 1 | | | 22.50 |
| Panel, A.C. | 0-30 Volts | Tripplet 221 | | | 1 | | | 10.35 |
| Panel, A.C. | 0-250 Volts | Triplett 221 | | | 1 | | | 10.35 |
| Volt-Ohm Milliammeter | | Simpson 260 | | | 1 | | | 34.50 |
| Watt-Hour, Single Phase | | Local power company | | | 1 | | | Free |
| Oscilloscope | 5" | Eico 425 | | | 1 | | | 69.95 |
| Tester, All purpose electrical | | Amerline | | | 1 | 1 | | 1.29 |
| Armature Growler | | Allstate | | | | 1 | | 26.95 |
| Cell, Voltage | | Allstate | | | | 1 | | 4.17 |
| Compression Kit | | | | | | | | |
| Timing and Vacuum | | Allstate | | | | 1 | | 14.49 |
| Regulator, Generator | | Allstate | | | | 1 | | 43.95 |
| Spark plug and tester | | Allstate | | | | 1 | | 56.50 |
| Starter, Battery load | | Allstate | | | | 1 | | 45.95 |
| Vacuum Tube | | Eico 625 | | | | | | |
| Voltmeter, Vacuum Tube, Basic | | Eico DEGGV | | | | 1 | | 50.20 |
| Electrical System, Basic | | Lab Volt SES501 | | | | 1 | | 195.00 |
| Generator, Audio Sine Wave | | Lab Volt DT55R | | | | 1 | | 99.00 |
| Tube Tester, Mutual Conductance | | Dynamic | | | | 1 | | 179.95 |
| | | | 1 | 1 | 165.89 | 1093.18 | | #1259.07 |

## CUTTING TOOLS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Bit, Auger (Set) | 4 to 16 | Irwin D13 | 1 | | | | | 15.75 |
| Electricians | 3/8" to 24" | Irwin 114E | | | 1 | | | 2.95 |
| Expansive | 7/8" to 3" | Irwin 2 | 1 | | | | | 3.30 |
| Countersink | | Stanley 137 | 2 | 2 | | | | .80 |
| Cutter, Circle | 1 3/4" to 8" | Stanley 55 | 1 | | | | | 5.65 |
| Drill and Countersink, Combined, HS | 4 | Cleveland 998 | | 2 | | | | 1.40 |
| Do | 5 | Cleveland 998 | | 3 | | | | 2.05 |
| Drill, Twist, Carbon (64ths) | 1/16" to $\frac{1}{8}$" | Cleveland 5 | 1 | 1 | | | | 28.90 |
| Twist, Carbon (Numbers) | 1 to 60 | Cleveland 8 | | 1 | 1 | | | 21.40 |
| Do ($\frac{1}{2}$" shank) | $\frac{1}{2}$" to 1" (32) | Cleveland 120R | | 1 | | | | 62.00 |
| Twist, Carbon (Letter) | A to Z | Cleveland 55 | | 1 | | | | 42.90 |
| (Stands for above drills) | | Cleveland | | 4 | | | | 2.45 |

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA |
|---|---|---|---|---|---|---|---|---|
| Reamer, Adjustable, with pilot | 5/32" to 1 1/16" | Bluepoint, Rm3 | | | | 1 | | 70.55 |
| Burring | ½" round shank | Cleveland 120 R | | 1 | | | | 4.50 |
| Ridge | 2 9/16" to 6" | Snap-on WR25 | | | | 1 | | 25.50 |
| Screw Plate, Machine Screw Set | | Greenfield OK Jr. B7 | | 1 | | | | 25.30 |
| Screw Plate | | Greenfield Little Giant | | 1 | | | | 143.00 |
| SAWING | | | | | | | | |
| Saw, Back | 12" 14tpi | Disston 4 | 4 | | | | | 5.65 |
| Compass | 12" | Disston 4 | 1 | | | | | 2.40 |
| Coping | 16½" | Disston 10 | 6 | | | | | .85 |
| Hack, Adjustable Pistol Grip | 12" | Millers Falls 1027 | | 2 | 1 | 1 | | 2.26 |
| Hack, Close Quarter | | Snap-on A51 | | | | 1 | | 1.85 |
| Hand, Panel | 24" 10 tpi | Disston D23 | 1 | | | | | 8.55 |
| Hand, Rip | 24" 5½ tpi | Disston D23 | 1 | | | | | 8.55 |
| Jewelers | 5" | Parker 43 | | 2 | | | | 2.00 |
| Nest of | | Disston #7 | | 1 | | | | 4.60 |
| SHEARING | | | | | | | | |
| Chisel, Cape | ¼" | Stanley 760C | | 1 | | 1 | | 1.15 |
| Cold | ½" | Stanley 743C | | 1 | | 1 | | .90 |
| Cold | 3/4" | Stanley 745 | | 1 | | 1 | | 1.15 |
| Diamond Point | ¼" | Stanley 770 | | 1 | | | | 1.15 |
| Pocket, (Set) | ¼" to 1½" (8ths) | Stanley 46 | 1 | | | | | 23.10 |
| Round Nose | ¼" | Stanley 765 | | 1 | | | | 1.15 |
| Socket (Set) | ¼" to 1" (8ths) | Stanley 720 | | | | | | |
| Cutter, Bolt | 5/16" cap. | Porter | | 1 | | | | 12.35 |
| Diagonal | 6" | Utica 41 | | 1 | 2 | 1 | | 2.90 |
| Wire Nippers | 7" | Utica 269 | | 1 | | | | 3.35 |
| Glass | | Red Devil | 6 | | | | | .50 |
| Pipe | 1/8 to 1½" Cap. | Ridgid 1A | | 1 | | | | 13.45 |
| Tubing | 1/8 to 1" | Ridgid 10 | | | | 1 | | 3.90 |
| File, Auger Bit | 7" | Nicholson #20 | 1 | | 1 | | | .65 |
| Contact Point | | Nicholson | | | | 12 | | .30 |
| Curve tooth, Standard | 8tpi | (½ round) Vixen | | | | 1 | | 3.25 |
| Do | | (Flat) | | | | 1 | | 2.75 |
| Extra slim taper | 4" | Nicholson | 4 | | | | | .35 |
| Extra slim taper | 6" | Nicholson | 4 | | | | | .45 |
| Extra slim taper | 8" | Nicholson | 4 | | | | | .65 |
| Flat, Second cut | 8" | Nicholson | | 2 | | | | 1.00 |
| Flat, Smooth | 10" | Nicholson | | 2 | | | | 1.45 |
| Half round, Smooth | 10" | Nicholson | | 1 | | | | 1.75 |
| Half round, second cut | 8" | Nicholson | 2 | | | | | 1.35 |
| Half round, Bastard | 10" | Nicholson | 1 | | | | | 1.50 |
| Mill, Second cut | 8" | Nicholson | | 4 | | | | .75 |
| Mill, second cut | 10" | Nicholson | | 1 | | | | 1.00 |
| Mill, Bastard | 10" | Nicholson | | 1 | | | | .75 |
| Needle (Set) | 5½" | Nicholson 12 | | 1 | | | | 12.45 |
| Round, Second cut | 8" | Nicholson | | 1 | | 1 | | .80 |
| Round, Smooth | 10" | Nicholson | | 1 | | 1 | | 1.15 |
| Round, Bastard | 12" | Nicholson | 1 | | | | | 1.25 |
| Square, Second cut | 8" | Nicholson | | 1 | | | | 1.05 |
| Three-square, Smooth | 8" | Nicholson | | 2 | | 1 | | 1.45 |
| Stubbs | | Stanley 946 | 1 | | | | | 3.60 |

CUTTING TOOLS CONTINUED

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Gouge, Outside Ground (Set) | ¼" tol (8ths) | Buck Brothers 8 | 1 | | | | | 21.00 |
| Knife, Sloyd | 2 5/8" | Hyde 83 | 2 | | 3 | 1 | | 1.50 |
| Trimming | | Stanley 99 | | | | 1 | | 1.35 |
| X-Acto (double set) | | X-Acto 62 | | | | 1 | | 2.75 |
| Opener, Can, Wall type | | Dazey | | 1 | | | | 3.75 |
| Plane, Block | | Stanley 60½ | 3 | | | | | 5.85 |
| Block | | Stanley 101 | | | | 2 | | .95 |
| Jack | | Stanley 5 | 4 | | | | | 8.33 |
| Smooth | | Stanley 3 | 4 | | | | | 7.47 |
| Spokeshave | | Stanley 51SS | 2 | | | | | 1.80 |
| Scraper, Cabinet | | Stanley 80M | 2 | | | | | 4.25 |
| Carbon, Flexible | | Snap-on CS-1 | | | | 2 | | 1.95 |
| Hand | 3" x 5" | Disston 20 | 2 | | | | | .45 |
| Plumber's | | Pexto | | 1 | | | | 1.39 |
| Putty Knife, Flexible | 1¼" | Hyde | 1 | | | 1 | | .85 |
| Wire Brush | | Osburn | | | | 1 | | 1.50 |
| Wood | | Millers Falls | 1 | | | | | 1.25 |
| Shears, Trimmer, Straight | 8" | Wiss38 | | 1 | 1 | | | 3.90 |
| Snips, Aviation, right | 10" | Wiss M-2 | | 1 | | | | 3.85 |
| Aviation, left | 10" | Wiss M-1 | | 1 | | | | 3.85 |
| Combination | 3" cut | Wiss 19 | | 2 | 1 | | | 6.25 |
| Hawks Bill | 3" cut | Pexto 15 | | 1 | | | | 7.60 |
| Tools, Carving (set) | | Buck Brothers | 1 | | | | | 11.35 |

$903.88

FORMING, ASSEMBLING and HOLDING TOOLS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Anvil | 50 lb. | Valcan | 1 | | | | | 48.00 |
| Bar, Pry and Jimmy | | Craftsman | | | | 1 | | 1.05 |
| Rolling Wedge | | Craftsman | | | | 1 | | 2.25 |
| Spreader and Removing | | Cornwell X51 | | | | 1 | | 4.65 |
| Wrecking | 24" | Craftsman 99A6 597C | 1 | | | | | 1.66 |
| Brace, Bit | 8" | Stanley 923 | 2 | | | | | 12.65 |
| Clamp, Bar | 2' | Hargrave 840 | 4 | | | | | 5.85 |
| Bar | 3' | Hargrave 840 | 4 | | | | | 6.35 |
| Bar | 4' | Hargrave 840 | 4 | | | | | 6.95 |
| Carriage | 4" | Hargrave 540P | | 2 | | | | 2.15 |
| Carriage | 6" | Hargrave 540P | | 2 | | | | 3.00 |
| Carriage | 8" | Hargrave 540P | | 2 | | | | 4.55 |
| Carriage | 10" | Hargrave 540P | | 2 | | | | 6.30 |
| Handy | 1" | Hargrave 1 | | 2 | | | | .35 |
| Handy | 2" | Hargrave 2 | | 2 | | | | .55 |
| Quick | 12" | Hargrave 498 | 4 | | | | | 3.10 |
| Saw, [illegible] | | Disston 2 | 1 | | | | | 10.50 |
| Valve and tube vulcanizing | | Allatate | | | | 1 | | 3.55 |
| Brake (set) | | Snap-on | | | | 1 | | 5.45 |

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Compressor, Piston ring, ratchet | 2 1/8-5" | Craftsman 9A4 716 | | | | 1 | | 1.97 |
| Valve spring | 10½" | Craftsman 9A4 695 | | | | 1 | | 5.86 |
| Copper, Electric | 3/8" tip | Stanley 3138 | | | 2 | | | 8.45 |
| Soldering (pair) | 2 lbs. | Pexto | | 1 | | | | 2.75 |
| Dolly, Anvil | | Snap-on BF714 | | | | 1 | | 10.95 |
| Toe | | Snap-on BF710 | | | | 1 | | 9.85 |
| Expander, Piston Ring | | Craftsman 9A4 661 | | | | 1 | | 1.83 |
| Extractor, Screw (set) | | Ezy-out 192 | | 1 | | | | 3.10 |
| Tap (set) | | Walton 1 | | 1 | | | | 10.00 |
| Grips, Vise | 7" | Peterson 7R | | | | 1 | | 2.15 |
| Vise | 10" | Peterson 10R | | | | 1 | | 2.45 |
| Groover, Hand | 4 | Pexto 4 | | 1 | | | | 3.30 |
| Hand | 2 | Pexto 2 | | 1 | | | | 3.50 |
| Gun, Soldering | | Weller S500 | | | 1 | | | 12.95 |
| Hammer, Ball pein | 8 Oz. | Stanley 308B | | 1 | 1 | 1 | | 2.55 |
| Ball pein | 16 Oz. | Stanley 310B | | 2 | 2 | 1 | | 2.90 |
| Ball pein | 32 Oz. | Stanley 314B | | | | 1 | | 3.50 |
| Blacksmith's hand | 40 Oz. | Stanley 402 | | 1 | | | | 5.10 |
| Combination Tire | 32 Oz. | Snap-on BH38A | | | | 1 | | 1.55 |
| Curved Claw Nail | 13 Oz. | Stanley 102 | 2 | | 1 | | | 3.30 |
| Do | 16 Oz. | Stanley 101½ | 2 | | | | | 3.30 |
| Dinging | 8 Oz. | Snap-on BF611 | | | | 1 | | 8.95 |
| Lead | | Shop made | | | | | | Free |
| Planishing | 12 Oz. | Dixon 26 | | 1 | | | | 4.55 |
| Riveting, Tinner's | 12 Oz. | Stanley 462 | | 1 | | | | 3.80 |
| Setting, Tinner's | 12 Oz. | Stanley 452 | | 1 | | | | 3.80 |
| Handle, File | 2 | Shur-Grip | 6 | 6 | | | | 2.40 D |
| File | 3 | Shur-Grip | 6 | 6 | | | | 3.00 D |
| File | 4 | Shur-Grip | 6 | 6 | | | | 3.00 D |
| Soldering Copper | 7 | Parker-Kalon | | 6 | 6 | | | 1.60 D |
| Handscrews, Adjustable | 5/0 4" | Jorgenson | 2 | | | | | 3.20 |
| Adjustable | 3/0 6" | Jorgenson | 2 | | | | | 3.70 |
| Adjustable | 0 8" | Jorgenson | 6 | | | | | 4.35 |
| Adjustable | 1 10" | Jorgenson | 6 | | | | | 5.05 |
| Hoist, Chain, Differential | 1 ton | Craftsman F9A 7875 | | | | 1 | | 39.72 |
| Inserter, Magnetic Key | | Craftsman | | | | 1 | | 1.80 |
| Iron, Tire, Straight | | Craftsman | | | | 1 | | 1.19 |
| Tire, Curved | | Craftsman | | | | 1 | | 1.29 |
| Jack, Hydraulic | 2 ton | Allstate 28A11 | | | | 1 | | 134.95 |
| Jig, Metal Bending | | Form-bend | | 1 | | | | 4.30 |
| Ladle, Melting, Bottom Pour | 5" | Rowell | | 1 | | | | 5.25 |
| Lifter, Valve, Overhead | | Craftsman | | | | 1 | | 1.97 |
| Valve, Screw-type | | Craftsman | | | | 1 | | 2.63 |

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Mallet, Carpenter's | 2½ x 3 x 5" | Stanley | 2 | | | | | 2.00 |
| Plastic, Soft face | 8 oz. | Stanley 594 | | 1 | 1 | 1 | | 3.00 |
| Raw-hide | 2" dia. 10 oz. | Stanley | | 1 | | 1 | | 2.45 |
| Nailset | 1/32 | Millers Falls 601 | 1 | | | | | .35 |
| Nailset | 2/32 | Millers Falls 601 | 1 | | | | | .35 |
| Nailset | 3/32 | Millers Falls 601 | 1 | | | | | .35 |
| Plate, Bench (stake holder) (If not furnished with bench) | 8" x 30" | Pexto 982 | | 1 | | | | 22.00 |
| Pliers, Brake spring | | Craftsman | | | | 1 | | 2.30 |
| Lock ring | | Craftsman | | | | 1 | | 2.00 |
| Long chain nose, side cut | 6" | Crescent | | | 1 | 1 | | 3.50 |
| Round nose | 6" | Kraueter 1611 | | | 1 | | | 3.75 |
| Short chain nose | 5" | Crescent | | 1 | 1 | 1 | | 2.24 |
| Side cutting | 8" | Utica 50 | | 1 | 1 | 1 | | 4.40 |
| Side cutting | 6" | Utica 50 | | | 1 | | | 3.75 |
| Slip joint, heavy duty | 8" | Utica 511 | | 1 | | | | 1.15 |
| Slip joint, heavy duty | 10" | Utica 511 | | | | 1 | | 1.60 |
| Water pump | 9½" | Channel Lock 420 | | | | 1 | | 3.25 |
| Puller, Gear, auto grip, | spread 5½" | Craftsman 9A4690 | | | | 1 | | 3.85 |
| Do | spread 8" | Craftsman 9A4690 | | | | 1 | | 7.97 |
| Hub, Universal 3 arm | | Craftsman 9A4 664 | | | | 1 | | 10.48 |
| Rivet set | | Pexto 7 | | 1 | | | | 1.60 |
| Rivet set | | Pexto 6 | | 1 | | | | 1.75 |
| Rivet set | | Pexto 3 | | 1 | | | | 2.20 |
| Screwdriver | 4" | Stanley 20 | 1 | 1 | 1 | 1 | | .63 |
| Screwdriver | 6" | Stanley 20 | 1 | 1 | 1 | 1 | | .93 |
| Screwdriver | 8" | Stanley 20 | 1 | 1 | | 1 | | 1.20 |
| Screwdriver | 10" | Stanley 20 | 1 | 1 | | 1 | | 1.33 |
| , close quarter | | Stanley 1013 | | | | 1 | | .55 |
| , Phillips 1 | | Stanley 2701 | | | | 1 | | .60 |
| , Phillips 2 | | Stanley 2702 | | | | 1 | | .70 |
| , Phillips 3 | | Stanley 2703 | | | | 1 | | .85 |
| , Square blade | 8" | Stanley 1007 | | | | 1 | | 2.20 |
| , Thin blade | 6" | Stanley 1008 | | | 1 | | | .60 |
| , Thin blade | 10" | Stanley 1008 | | | 1 | | | .77 |
| Screwdriver, Bit | 3/8" | Stanley 26 | 1 | | | | | .90 |
| , Clutch head (set) | 5/32, ¼, 5/16 | | | | | 1 | | 5.12 |
| , Offset | | Stanley 670 | | | | 1 | | .70 |
| , Offset | | Yankee 3400 | | | | 1 | | 1.10 |
| , Pocket | | Stanley 1010 | | | 1 | | | .35 |
| Tongs, Gad | | Stanley 16 | | 1 | | | | 8.55 |
| Tool, Flaring (set) | | Craftsman | | | | 1 | | 4.75 |
| Valve flaring | | Allstate | | | | 1 | | .32 |
| Valve Lapping | | Allstate 9A4704 | | | | 1 | | 2.73 |
| Tweezers, Soldering | | Broadhead & Garrett | | | 1 | | | 2.75 |
| Vise, Drill press | Model 16 Pivot-Lock Safety Vise | | | 1 | | 1 | | 10.75 |
| Machinist | 3½" | Columbian 603½ | | 3 | | 2 | | 41.16 |
| Utility | | Columbian D43½ | | 2 | | 2 | | 9.66 |
| Woodworker's Rapid action | | Columbian 18D | | 1 | | | | 18.00 |

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Wrench, Adjustable, alloy | 4" | Crescent | | | | 1 | | 1.90 |
| Adjustable, alloy | 6" | Crescent | | | | 1 | | 1.95 |
| Adjustable, alloy | 8" | Crescent | 1 | 1 | 1 | 1 | | 2.30 |
| Adjustable, alloy | 10" | Crescent | | 1 | | 1 | | 2.85 |
| Allen, socket set | | Holo-chrome 4990-3/8 | | 1 | | 1 | | 1.25 |
| Bicycle spoke | | Craftsman | | | | 1 | | .60 |
| Box-end (set of 6) | | Craftsman | | | | 1 | | 6.27 |
| Combination (set of 6) | | Craftsman | | | | 1 | | 5.23 |
| Drain plug | | Craftsman | | | | 1 | | .55 |
| Ignition, combination midget, 8 piece | | Craftsman | | | | 1 | | 3.92 |
| Monkey | 12" | Billings Coes 91 | | | | 1 | | 5.65 |
| Nut driver (set) | | Craftsman | | | 1 | | | 5.93 |
| Pipe | 8" | Ridgid | | | | 1 | | 2.65 |
| Rim | | Snap-on 402 | | | | 1 | | 6.95 |
| Socket (set of 45) | ½" drive | Craftsman | | | | 1 | | 42.55 |
| Socket (set of 45) | ¼" drive | Craftsman | | | | 1 | | 39.95 |
| Tap, "T" handle | | Greenfield 328 | | 1 | | | | 1.05 |
| Tappet (set of 6) | | Billings 47 | | | | 1 | | 11.50 |
| Torque | 0 to 150 ft. lbs. | Craftsman | | | | 1 | | 11.18 |
| Torque | 0 to 150 in. lbs. | Craftsman | | | | 1 | | 10.85 |
| | | | #151.95 | 35.73 | 105.32 | 51.25 | | #513.25 |
| **FORMING, ASSEMBLING AND HOLDING TOOLS** | | | | | | | | |
| Seamer, Hand | | 794 Pexto 1 | | 1 | | | | 5.50 |
| Stake, Beakhorn | | 901 Pexto 1 | | 1 | | | | 65.00 |
| , Blowhorn | | 925 Pexto 1 | | 1 | | | | 39.00 |
| , Needlecase | | 957 Pexto 1 | | 1 | | | | 22.00 |
| , Bevel-edge square | | 932 Pexto 1 | | 1 | | | | 22.00 |
| | | | | 153.50 | | | | 153.50 |
| **MACHINES AND HEATING EQUIPMENT** | | | | | | | | |
| Brake, Box-pan | | Di-Acro Model 24 | | 1 | | | | 297.00 |
| Specifications: 24" width, 16 ga. Capacity mild steel | | | | | | | | |
| (Stand for Box-pan Brake) | | | | 1 | | | | 65.00 |
| Compressor, Air | | DeVilbiss #UDJ5002 | | | | 1 | | 279.95 |
| Specifications: ½ h.p. motor, single phase, 110 v., A.C. 1 cyl., 30 gallon tank | | | | | | | | |
| Accessories: Motor starter, single phase | | | | | | 1 | | 6.95 |
| Airline hose, 25 ', w/ male connections at ends | | | | | | 1 | | 6.25 |
| Former, Slip-roll | 30" | Pexto 381 | | 1 | | | | 145.00 |
| Furnace, Bench combination, gas w/melting pot | | Johnson 118 | | 2 | | | | 59.90 |
| Furnace, Melting, w/blower, 3 crucibles | | Speedi-melt 16-1 | | 1 | | | | 361.00 |
| Accessories: Shank, hand | | Western Materials S-10 | | 1 | | | | 10.00 |
| Tongs, Plain crucible | | Western Materials 10B | | 1 | | | | 26.50 |
| Grinder, Tool | | Delta 23221 | 1 | 1 | | | | 175.15 |
| Specifications: ½ h.p. motor, 60cycle, single phase, A.C. 2-7" Aluminum oxide wheels, 1267 & 283-815 Waterpot, twin light safety shields, 4 lamp bulbs, wheel guards, tool rests and pedestal. | | | | | | | | |

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Grinder, Tool | | | | | | | | |
| Accessories: Medium knotted wire brush, 6", 5/8 bore | | #1237 | | 1 | | | | 7.20 |
| Plane blade grinding attachment | | #1294 | 1 | | | | | 13.95 |
| Jointer | 6" | Delta #37-221 | 1 | | | | | 208.55 |
| Specifications: ½ h.p. motor, 220/440 3 ph. A.C., 1725 rpm w/manual starter, motor pulley, V-pulley, 3 h.s. steel knives, 2-way tilting fence w/dual control, arbor pulley, front safety knife guard, cast iron stand. | | | | | | | | |
| (Motor for above- Delta 66-000 | | | 1 | | | | | 37.40 |
| Lathe, Metalworking | | South Bend CL-644Z | | 3 | | | | 525.00 |
| Specifications: 9" bench, 3' or 3½' bed, quick change, Horizontal drive, Countershaft w/power cross feed, ½ h.p. motor, 110/220 single phase A.C. | | | | | | | | |
| Accessories: Chuck, Independent, 6" w/wrench | | CL4006NK | | 2 | | | | 51.00 |
| Universal, 5" w/wrench | | CL3005NK | | 2 | | | | 82.00 |
| Jacobs w/arbor, ½" cap. | | #2 Morse Ta. | | 2 | | | | 13.70 |
| Dog (set of 6) 3/8" to 1½" | | CE2105 | | 1 | | | | 10.00 |
| Knurling tool, revolving head | | CE3615 | | 2 | | | | 20.75 |
| Motor control, Drum type | | EH179 | | 3 | | | | 8.50 |
| Tool holder, Boring | | CE423 | | 1 | | | | 12.71 |
| , Cut-off, Rt. Hand | | CE736R | | 2 | | | | 7.38 |
| , Left hand | | CE847L | | 2 | | | | 3.22 |
| , Right hand | | CE847R | | 2 | | | | 3.22 |
| , Straight | | CE847S | | 2 | | | | 3.22 |
| Bench, angle steel, 26 x 60 x 29 3/16 | | CE1780 | | 2 | | | | 46.50 |
| Lathe, Woodworking | | Delta 46-212 | 2 | | | | | 316.70 |
| Specifications: 12", 37" between centers, 57" O.A., 4-speed bench, pulleys, ½h.p. motor, 115/230 single phase, A.C., switch rod | | | | | | | | |
| Accessories: Face plate, | 6" | 937 | 2 | | | | | 5.35 |
| Tools, Basic set of 8 | | 130 | 2 | | | | | 23.45 |
| Machine, Combination sheet metal rotary | | Pexto CO 547 | | 1 | | | | 134.00 |
| Planer, Surface | 12" x 5" | Powermatic 100 | 1 | | | | | 490.00 |
| Specifications: Safety type ball bearing cutterhead w/three knives, 2 groove cutter head pulley, belt guards, floor stand w/motor base, 2 h.p. motor, 3 phase w/manual switch | | | | | | | | |
| Press, Drill | 15" | Delta 15-208 | 1 | 1 | | | | 163.35 |
| Specifications: Belt guard, pivoting motor mount plate, Built in depth gauge, depth stop, motor pulley, V-belt, ½" Jacobs chuch w/key | | | | | | | | |
| Accessories: ½ h.p. motor, Delta, 115.230, 1725 rpm, 60 cycle, A.C., with starter | | #62-000 | 1 | 1 | | | | 41.65 |

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Press, Hand fed | 10" x 15" Chase size | Chandler & Price Model 1 | | | | | 1 | 2268.00 |
| Accessories: | 10" x 15" Chase | | | | | | 2 | 16.95 |
| | 1 h.p. motor, 115/230, 1725 rpm, 60 cycle A.C. | | | | | | 1 | 41.65 |
| Press, Proof | # 1534H | Challenge | | | | | 1 | 287.00 |
| Specifications: | w/stand, 10" x 12" ink plate and brayer | | | | | | | |
| Press, Offset | Model 241 | Davidson Dual | | | | | 1 | 2100.00 |
| Specifications: | Floor space: 26" x 72" x 56" high, Weight w/feeder 726 lbs., Sheet size: Max. 10" x 14", Min. 3" x 5", Motor: ¼ h.p. re ulsion-induction, 1725 rpm Belt: molded rubber endlessV w/adj. pulley | | | | | | | |
| Press, Rubber stamp | | Berkroy | | | | | 1 | 199.50 |
| Accessories: | # 1 supply kit for Berkroy | | | | | | 1 | 35.00 |
| Router- Shaper | | Stanley H264 | 1 | | | | | 55.95 |
| Specifications: | 7/8 h.p. motor, base, chuck, sub-base | | | | | | | |
| Accessories: | Bit, Beading | #85125 | 1 | | | | | 5.65 |
| | Cove | #85128 | 1 | | | | | 5.65 |
| | Rounding over | #85120 | 1 | | | | | 4.15 |
| | Straight | #85095 | 1 | | | | | 1.35 |
| | Straight | #85098 | 1 | | | | | 1.85 |
| | Veining | #85106 | 1 | | | | | 1.85 |
| | Gauge, Straight and Circular | H280 | 1 | | | | | 3.40 |
| | Tip, Templet | GA-H225 | 1 | | | | | 8.40 |
| | Wheel, Grinding | MSH 195 | 1 | | | | | 1.55 |
| | Wheel, Grinding | MSH 210 | 1 | | | | | 1.00 |
| Saw, Circular | 10" | Delta Unisaw 34451 | 1 | | | | | 542.50 |
| Specifications: | Guard, Splitter, extension wings, micro-set rip fence, combination blade, miter gauge, front graduated guide bar, rear guide bar, motor pulley, set/3 matched V belts, 2 H.P. motor, 3 phase w/manual starter | | | | | | | |
| Accessories: | Dado head, 6" diameter, 5/8" hole, 1/16" to 13/16"-34-333 | | 1 | | | | | 32.50 |
| | Dado table insert | 1452 | 1 | | | | | 5.50 |
| Saw, Band, Wood cutting | 14" | Delta 287 | 1 | | | | | 268.10 |
| Specifications: | Wheel guards, arbor pulley, wood cutting blade, cast iron stand, belt guard, V belt and motor pulley, ½h.p. motor, 3 phase, 220/440, 60 cycle, A.C., 1725 r.p.m., Manual starter size 0, across the line type for motor. | | | | | | | |
| Saw, Miter box w/saw | 28 x 4" saw | Stanley 2246 | 1 | | | | | 62.65 |
| Saw, Power hack | | Wells #300 | | 1 | | | | 263.00 |
| Specifications: | Satnd model w/ ¼ h.p. motor (Split phase) | | | | | | | |
| Saw, Scroll | 24" | Delta 40-405 | 1 | | | | | 173.75 |
| Specifications: | Stand, 4-step cone pulley, 4-step motor pulley, V belt, belt and pulley guard, 1 saber and 3 scroll blades | | | | | | | |
| Accessories: | ¼ h.p. motor, 115-230, 60 cycle A.C., with on-off switch (62-110 Delta, single phase) | | 1 | | | | | 42.75 |

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA |
|---|---|---|---|---|---|---|---|---|
| Shaper, Metal | 7" | South Bend CS100 | | 1 | | | | 632.00 |
| Specifications: | Vise, drive unit for motor, motor pulley, V-belt, guards, work light, built-in push button type across line manual starter, motor included | | | | | | | |
| Accessories: Tool holder | | CS9630 | | 1 | | | | 10.35 |
| Machine stand | 20" x 32" x 29 3/8" | CE9141 | | 1 | | | | 27.50 |
| Welder, Electric | A.C. 180 amps w/arc booster | Lincwelder AC1805 | | 1 | | | | 120.00 |
| Accessories: | 25' #4 electrode cable, 20' #4 ground cable, LPH-2 head shield, 10 LVH lense, non-spatter cover glass, INS electrode holder, GC-300 Ground clamp(Complete kit) | | | 1 | | | | 35.00 |
| Welder, Oxy-acetylene | | Broadhead-Garrett 3745 | | 1 | | | | 208.00 |
| Specifications: | Complete kit to include the following: Pipeliner torch set; Econoflow oxygen regulator; Econoflow acteylene regulator; Hose, 25' 3/16" 2 in 1; Goggles, pair; Lighter, friction; Wrench | | | | | | | |
| Machine, Milling | # 21-100 | Delta Vertical | | 1 | | | | 960.00 |
| Specifications: | Working surface 6½ x 24", range 16" long Cross-feed travel 6 3/4", Vert. travel 10½", Spindle taper R8, Quill 3" diameter, Ht. 72", Width 37 3/4", depth 33 3/4", with cabinet base. | | | | | | | |
| Accessories: | Motor, Delta 66-510 3 phase, 5/8" shaft, 1725 rpm, 208/220/440 volt, 60 cycle A.C. | | | 1 | | | | 40.00 |
| | Magnetic Starter # 49-396 | | | 1 | | | | 42.35 |
| | Reversing Drum switch #49-392 | | | 1 | | | | 17.90 |
| | Belt Guard #21-813 | | | 1 | | | | 5.50 |
| | Machine Vise #21-811 | | | 1 | | | | 63.50 |
| | Collets (set of 6) #21-800 | | | 1 | | | | 45.00 |
| | End Mill holder #21-806 | | | 1 | | | | 17.75 |
| | Arbor for Drill chuck (#3 Jacobs chuck) | | | 1 | | | | 10.00 |
| | Lamp Attachment | | | 1 | | | | 10.35 |
| | Vertical Milling cutters (set 1/8" to 3/4") | | | 1 | | | | 40.00 |
| | Woodruff Keyway cutters #404 | 1/8" | | 1 | | | | 5.25 |
| | # 605 | 3/16" | | 1 | | | | 6.00 |
| | #806 | ¼" | | 1 | | | | 6.25 |
| | #1208 | 3/8" | | 1 | | | | 7.00 |
| | | | | | | | | 1437.60 |

PORTABLE MACHINES

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Drill, Electric, standard duty ¼" | | Porter-Cable 575 | | | 1 | | | 55.00 |
| Drill, Electric, standard duty 5/8" | | Porter-Cable 580 | | | | 1 | | 135.00 |
| Sander, belt, heavy duty | 3" x 24" | Porter-Cable 503 | 1 | | | | | 185.50 |
| Sander, finishing | | Porter-Cable 106A | 1 | | | | | 65.50 |

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Bellows, Molders | 10" | Patterson Bros. | | 1 | | | | 8.65 |
| Bulb and sponge | 4 oz. | Patterson Bros. | | 1 | | | | 3.85 |
| Flask, Wood | 10" x 12" | Shop made | | 1 | | | | n.c. |
| Flask, Metal | 10" x 12" | Ideal | | 1 | | | | 45.00 |
| Rammer, bench | 3½"x 14" | Patterson Bros. | | 1 | | | | 4.31 |
| Riddle (Galvanized wire) | 16" | Patterson Bros. | | 1 | | | | 3.65 |
| Slick and Oval | 1" | Patterson Bros. | | 1 | | | | 2.75 |
| Trowel, Square | 1¼" x 6" | Patterson Bros. | | 1 | | | | 3.15 |
| Tire bead Band | | Allstate | | | | 1 | | 5 |
| Battery, Storage | 6 volts, 3 cell, 130 | amp hr. Allstate | | | | 1 | | 17.00 |
| Cables, Booster (set) | 8' | Allstate | | | | 1 | | 3.79 |
| Creeper, Auto | 16" x 36" | Craftsman | | | | 1 | | 7.62 |
| Electri-Kit | | Crow Model 1000 | | | 1 | | | 209.90 |
| Lamp, trouble, heavy cord w/lamp protector, 2 outlets | | | | | 1 | 1 | | 3.80 |
| Torch, Master w/pencil burner and cylinder | | Bernz-O-Matic TX-10 | | 1 | | | | 9.95 |
| Tube, brake bleeder | | Allstate | | | | 2 | | .21 |
| Vacuum Frame, Plate maker | 30" x 40" | Nu-Arc Model FT-18M | | | | | 1 | 495.00 |
| Cutter, Paper | 30½" cutter | Challenge Model 305 | | | | | 1 | 1556.00 |
| Sink, Darkroom Developing | | Brown Model 1615 FG | | | | | 1 | 550.00 |
| Safelight and Viewer, Darkroom | | NuArc Model 19E | | | | | 1 | 103.00 |
| Dispenser, Tape | Two roll core | Scotch C-22 | | | | | 1 | 6.50 |
| Gun, Spray, Offset | (to fit Model 251 Davidson) | Dry-Easy Flo | | | | | 1 | 69.85 |
| Thermometer, Developing | | Weksler #237Y | | | | | 1 | 2.00 |
| Knife, Stripping | | X-Acto #1 | | | | | 2 | .60 |
| (Blades for above: Nos. 10 and 11) | | | | | | | 3 | .60 |
| Funnel, Stainless Steel | | Globe | | | | | 1 | 7.45 |
| Graduate, Stainless Steel | 1 qt. Cap. | Globe | | | | | 1 | 8.45 |
| Test paper, Litho | | Hydroin PH | | | | | 1 | 6.00 |
| Brushes, Artists Opaque | | Red Head | | | | | 6 | .35 |
| Trays, Photographic | 11" x 14" | Cesco-lite | | | | | 2 | 4.50 |
| Triangles, Plastic | 10" | Alteneder No. 2911 | | | | | 2 | 2.25 |

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Timer | | Gralab Model 165 | | | | | 1 | 23.95 |
| Tank, Storage and mixing | 5 gal. cap. | Globe | | | | | 1 | 14.50 |
| Stick, Composing | 8" | Rouse | | | | | 2 | 10.70 |
| Composing | 12" | Rouse | | | | | 1 | 12.80 |
| Can, Benzine, Brass | 1 qt. cap. | | | | | | 2 | 4.25 |
| Reglets, Wood | 6 and 12 point | Hamilton (25 strips) | | | | | 2 | .13 |
| Gauge, Printers Line | | Lufkin No. 527S | | | | | 4 | 4.30 |
| Rule, Newspaper | Agate and non-pariel | Lufkin No. 573 | | | | | 1 | 8.80 |
| Pins, Gauge | | Megill (Hand fed & | | | | | 6 | .65 |
| | | Auto feed) | | | | | 6 | .75 |
| Knife, Ink | 3½" x 1¼" | Lamson Square End | | | | | 2 | 1.75 |
| Cutter, Lead and Rule | | Rouse No. 45 | | | | | 1 | 97.00 |
| Mallet, Rubber | 8 oz. | | | | | | 1 | 2.75 |
| Mitering Machine, Hand | 83 pica | Rouse | | | | | 1 | 110.00 |
| Machine, Numbering | | Challenge | | | | | 2 | 32.00 |
| Press, Padding | | ChapPadco #8303-13 | | | | | 1 | 15.75 |
| Planer, Type (w/leather top) | 6" | | | | | | 1 | 2.25 |
| Quoins, Wickersham | 5/8" wide | #1 | | | | | 6 | 12.50 |
| Regular | | Challenge #1 standard | | | | | 6 | 3.50 |
| Knife, Makeready, Overlay | | Lamson | | | | | 1 | 1.00 |
| Key, Quoin, high speed | "T" head | Challenge | | | | | 1 | 3.50 |
| Quoin (for Wickersham) | | "2" | | | | | 1 | 2.80 |
| Holder, Tympan paper | 12 " or 20" | Rouse | | | | | 1 | 33.00 |
| Tweezers, Printers | (narrow point) | Globe model 430 | | | | | 1 | 1.00 |
| Stitcher, Wire | | Acme-Champion Model A | | | | | 1 | 424.00 |
| Leads and Slugs | | ATF Duration * 1 pt. | | | | | 1 | 5.50 |
| | | * 2 pt. | | | | | 1 | 4.95 |
| (All leads and slugs | | * 3 pt. | | | | | 1 | 4.95 |
| available in strips | | * 4 pt. | | | | | 1 | 4.95 |
| 24" long) | | * 6 pt. | | | | | 1 | 4.95 |
| | | *12 pt. | | | | | 1 | 5.30 |
| * denotes one package of each size | | | | | | | | |
| Spaces and quads, Type foundry | | ATF, #2102-6, 8, 10, 12, 14, 18, 24, 30 (Complete Assortment) | | | | | 1 | 4.40 |

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Type, Foundry | | American Type Founders | | | | | | |
| (A carefully selected list of foundry type must be made by the instructor. Some of the more popular type faces are listed at the right. This list is by no means complete and is only to serve as a guide) | | 8 pt. Bank Gothic Light | | | | | 1 | 9.05 |
| | | 10 pt. Bank Gothic Light | | | | | 1 | 10.45 |
| | | 10 pt. Brush Medium | | | | | 1 | 10.45 |
| | | 12 pt. Brush Medium | | | | | 1 | 11.25 |
| | | 6 pt. Century Expanded | | | | | 1 | 8.10 |
| | | 8 pt. Century Expanded | | | | | 1 | 9.05 |
| | | 8 pt. Century Expanded (Italic) | | | | | 1 | 9.05 |
| | | 10 pt. Copperplate Gothic | | | | | 1 | 10.45 |
| | | 12 pt. Copperplate Gothic | | | | | 1 | 11.25 |
| | | 12 pt. Liberty 511 | | | | | 1 | 11.25 |
| | | 14 pt. Liberty 511 | | | | | 1 | 13.60 |
| | | 18 pt. Liberty 511 | | | | | 1 | 14.65 |
| | | 12 pt. Royal Script 304 | | | | | 1 | 11.25 |
| | | 18 pt. Royal Script 304 | | | | | 1 | 14.65 |
| | | 14 pt. Stymie Bold 511 | | | | | 1 | 13.60 |
| | | 18 pt. Stymie Bold 511 | | | | | 1 | 14.65 |
| Thin Spaces, Brass & Copper | | No. 20A Assortment Copper thin spaces | | | | | 1 | 5.50 |
| | | No. 20B Assortment Brass thin spaces | | | | | 1 | 5.50 |
| Transportation | | | | | | | | |
| Strap-Battery Carrier | | Allstate | | | | 1 | | .30 |
| | | MAINTENANCE TOOLS AND EQUIPMENT | | | | | | |
| Brush, Glue | 1" | Broadhead & Garrett 612 | 2 | | | | | .70 |
| Burnisher | | Stanley 185 | 1 | | | | | 1.80 |
| Card, File and Brush | | Nicholson | 1 | 2 | | | | 1.80 |
| Do, Common | | Nicholson | 2 | 2 | 1 | 1 | | 1.05 |
| Duster, Counter | | Broadhead & Garrett 2292 | 4 | 4 | 2 | 2 | | 18.85 d |
| Dustpan | | | 1 | 1 | 1 | 1 | | 2.00 |
| Dresser, Wheel | | Huntington No. 0 | 1 | 1 | | | | 1.45 |
| Funnel | 8" | Allstate | | | | 1 | | .98 |
| Gun, Grease | | Broadhead & Garrett 1163 | | | | 1 | | 4.50 |
| Grease, hand | 23 oz. | Allstate | | | | 1 | | 2.55 |
| Suction, Oil | 20 oz. | Allstate | | | | 1 | | 2.75 |
| Hone, Burnishing | 2 11/16" to 4 1/8" | Craftsman | | | | 1 | | 9.75 |
| Measure, Quart | | Allstate | | | | 1 | | 1.65 |

$23.10 $13.36 $13.38 $10.23.96 $794.75

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Oiler, Bench, steel | ½ pint | 149C Eagle | | 3 | | 2 | 1 | .65 |
| Bench, steel | 1/3 pint | 139C Eagle | 1 | 1 | 1 | 1 | 2 | .50 |
| Hydraulic pump | 1 pint | Broadhead & Garrett | | | | 1 | | 2.10 |
| Spring, Automobile | 1/3 pint | Broadhead & Garrett | 1 | | | 1 | | 1.80 |
| Oilstone, India-Washita, Combination | | Arkansas No. 186 | 1 | | | | | 2.40 |
| Slip, India | | Arkansas No. 44 | 1 | | | | | 1.10 |
| Slip, India pocket | | Norton 1B 134 | | 2 | | | | 1.50 |
| Slip, Carving tool set, India | | Norton FS-76 | 1 | | | | | 3.50 |
| Opener, can and oil spout | | Allstate | | | | 1 | | 1.49 |
| Set, Saw | | Disston 34 | 1 | | | | | 7.35 |
| Sweep, floor, all black horsehair | 16" | Broadhead & Garrett | 2 | 1 | 1 | 1 | 1 | 6.40 |
| | | | 1 | 2 | 1 | 1 | 1 | |
| | | | 15.40 | 2.24 | 1.65 | 1.52 | 1.05 | = 34.02 |
| SAFETY AND FIRST AID EQUIPMENT | | | | | | | | |
| Apron, Chrome leather | 24" x 36" | | | 1 | | | | 9.10 |
| Curtain | to required specifications | | | 1 | | | | 4.00 |
| Extinguisher, Fire $CO_2$ | 5 lb. | | 1 | 1 | 1 | 1 | 1 | 28.80 |
| Fan, Exhaust 1680 Cu. ft/min. | 16" blade | Diehl 16FPD16 | | 1 | | | | 95.00 |
| First Aid Kit, General | | Johnson & Johnson | 1 | | | 1 | | 15.00 |
| Gloves, Rubber | | Resisto | | 1 | | 1 | | 5.00 |
| Welder's Chrome leather Gauntlet | | | | 2 | | | | 5.50 |
| Goggles, Safety | | Monogoggle 91A | 2 | 2 | 2 | 2 | 2 | 2.85 |
| Hose, Flexible Exhaust, metal | 3" x 10' | Allstate | | | | 1 | | 5.35 |
| Oily Waste Can | Automatic 10 gallon | Justrite 9-3 | 1 | | | 1 | 1 | 12.95 |
| Puller, Fuse | | Ideal | | | 1 | | | 1.15 |
| Shield, Face | | Protector V1-44 | | 3 | | | | 5.95 |
| Stand, Jack, Pair | 3 ton | Allstate | | | | 1 | | 15.10 |

FURNITURE

| | SIZE/CAP. | BRAND & CAT. NO. | W | M | E | T | GA | COST EA. |
|---|---|---|---|---|---|---|---|---|
| Bench, Woodwork Woodworking 54" x 64"-32½" high, Locker type, 12 lockers | | Broadhead & Garrett (L-4) | 2 | | | | | 235.00 |
| Locker type, single station | 28½" x 64" x 32½" high | B & G L-5 | | 2 | 1 | 2 | 1 | 117.00 |
| Arc welder's | 36" x 36" x 33½" high | B & G 4181 | | 1 | | | | 76.00 |
| Gas welder's | 36" x 36" x 33½" high | B & G 4181 | | 1 | | | | 58.00 |
| Glue and Stain | 24" x 60" x 30" high | B & G GS24 | 1 | | | | | 79.00 |
| Molding | 24 x 48 x 60" high | B & G MB 1 | | 1 | | | | 160.00 |
| | Galvanized paneling | for molding bench | | 1 | | | | 9.00 |
| Sheet metal w/plates | 40" x 96" x 32" high | B & G SM90 | | 1 | | | | 310.00 |
| Work | 30" x 72" long | Lyons No. 2525 (With shelves) | | | | | 1 | 46.90 |
| Cabinet, Pâle, steel, 4 drawer w/lock, letter size | | Cole #204 | 1 | | | | | 59.35 |
| Storage, steel, 36 x 24 x 78" high | | B & G 160 | 1 | 1 | | | | 79.95 |
| Negative and plate storage | 17 x 22" | Richmond (25 Drawer) | | | | | 1 | 190.00 |
| Furniture (Comes complete with furniture font-280 pieces) | | Hamilton #1115 | | | | | 1 | 67.00 |
| Type | | Hamilton Model 111 (Full size w/cases) | | | | | 2 | 317.00 |
| Chair, Instructor's | | B & G #747 | 1 | | | | | 62.50 |
| Desk, Instructor's | 30" x 60" x 29" high | Lyons 900 | 1 | | | | | 118.10 |
| Stool, Steel, square seat | 14" top x 22" high | Lyons 1750 | 20 | | | | | 4.35 |
| Table, Plate finishing | 22" x 26" | NuArc Globeline | | | | | 1 | 190.00 |
| Light | 30" x 40" | NuArc Model LT-42 | | | | | 1 | 175.00 |
| Line-up | Floor model | NuArc Model RR-26 | | | | | 1 | 495.00 |
| Imposing | 20" x 36" | Hamilton | | | | | 1 | 87.50 |
| Station, Demostration, Fuseless | | Lab Volt Model 205P | | | 1 | | | 695.00 |
| Camera, | Vertical 18" | Kenro Model V185 | | | | | 1 | 1,275.00 |
| | Vacuum back and Vacuum pump for | Kenro Model V185 | | | | | 1 | 160.00 |
| | | | | | | | | $ 6776.75 |

117.35 1103.90 895.65 322.50 4336.85

SMALL ENGINES REQUIREMENTS

At least 6 small engines of both 2 and 4-cycle should be available. No brand names or prices will be listed since suppliers many times have special offers for educational institutions. At least 50.00 should be allowed for the purchase of these engines.

# APPENDIX

## GUIDE FOR DETERMINING SPACE NEEDS FOR SELECTED SHOP EQUIPMENT*

*Considerations for certain programs

A. Open space is needed to bring in equipment to be serviced. Four feet should be allowed as working space around each piece of equipment.

B. The local community should allow space for future expansion.

C. Due to local community or program needs-space should be allowed for specific activities or equipment that is not included in the following list.

| Item and Specification | Machine and working space requirements per machine (sq. ft.) | Number of Machines | Space Needed |
|---|---|---|---|
| Balancing equipment, wheel | 10 - 50 | | |
| Barshear, metal cutting | 30 | | |
| Bench, Demonstration | 40 | | |
| Bench, Electronic | 140 | | |
| Bench, Glue and Stain | 88 | | |
| Bench, Layout | 90 - 125 | | |
| Bench, Molding | 30 | | |
| Bench, Power Mechanics | 90 | | |
| Bench, sheet metal w/plates | 130 | | |
| Bench, Silk screening and bookbinding | 80 | | |
| Bench, Woodworking | 118 | | |
| Brake, Drum and Shoe Reconditioning | 35 | | |
| Brake, sheet metal | 40 - 90 | | |
| Cabinet, Type and Accessories | 27 | | |
| Cabinet, tool 1-6 x 2-6 | 11 | | |
| Camera, Offset | 33 | | |

| Item and Specification | Machine and working space requirements per machine (sq. ft.) | Number of Machines | Space Needed |
|---|---|---|---|
| Changer, Tire | 60 | | |
| Compressor, air, electric 100 lb. max. | 15 | | |
| Crane, engine lifting | 50 | | |
| Cutter, Paper | 48 | | |
| Cutting machine, oxy. | 50 | | |
| Drill press, heavy duty | 60 | | |
| Forge area (gas or coal) | 200 | | |
| Grinder, edge tool, 1/3 H.P., 7"x 1" wheels | 30 | | |
| Grinder, heavy duty, ½ - 1 H.P. | 30 | | |
| Grinder, Valve and seat | 25 | | |
| Grinder, w/mower sickle attachment | 50 | | |
| Heat treatment equipment | 50 | | |
| Hydraulic unit | 60 | | |
| Jointer, woodworking | 75 | | |
| Lathe, metal working | 40 - 80 | | |
| Lathe, woodworking | 25 | | |
| Maker, Plate | 20 | | |
| Milling Machine | 40 - 60 | | |
| Pittsburg lock machine | 70 - 100 | | |
| Planer, thickness | 140 | | |
| Press, Arbor | 30 | | |
| Press, Cylinder | 75 | | |

| Item and Specification | Machine and working space requirements per machine (sq. ft.) | Number of Machines | Space Needed |
|---|---|---|---|
| Press, Offset | 75 | | |
| Press, Platen | 60 | | |
| Press, Proof | 25 | | |
| Racks, lumber | 25 x 50 | | |
| Racks, metal | 18 x 36 | | |
| Sander, abrasive disc | 40 | | |
| Saw, Band, woodworking | 50 | | |
| Saw, Circular | 175 | | |
| Saw, Hack, electric | 40 | | |
| Saw, radial arm | 120 | | |
| Shaper | 80 - 100 | | |
| Slip rolls | 50 | | |
| Squaring shears | 70 | | |
| Stands, Engine | 65 | | |
| Steam cleaner | 100 | | |
| Stone, Imposing | 64 | | |
| Surface Grinder | 70 | | |
| Table, Drawing | 35 | | |
| Table, Light 2-10 x 3-8 | 33 | | |
| Tank, Cleaning (auto) | 28 | | |
| Tester, Distributor | 15 | | |
| Tester, Motor analyzer | 15 | | |
| Valve Grinder and refacer | 30 | | |

| Item and Specification | Machine and working space requirements per machine (sq. ft.) | Number of Machines | Space Needed |
|---|---|---|---|
| Welding, electric | 50 | | |
| Welding, oxy-acetylene | 50 | | |
| Welding, inert gas | 50 | | |

SUMMARY OF SPACE NEEDED

| | Square feet Needed |
|---|---|
| 1. Space for equipment | _____ |
| 2. Space for office, classroom and planning area | _____ |
| 3. Space for storage and finishing | _____ |
| 4. Open space for equipment to be serviced, construction projects, etc. | _____ |
| 5. Others (to meet local/program needs) | _____ |
| Total area needed | _____ |